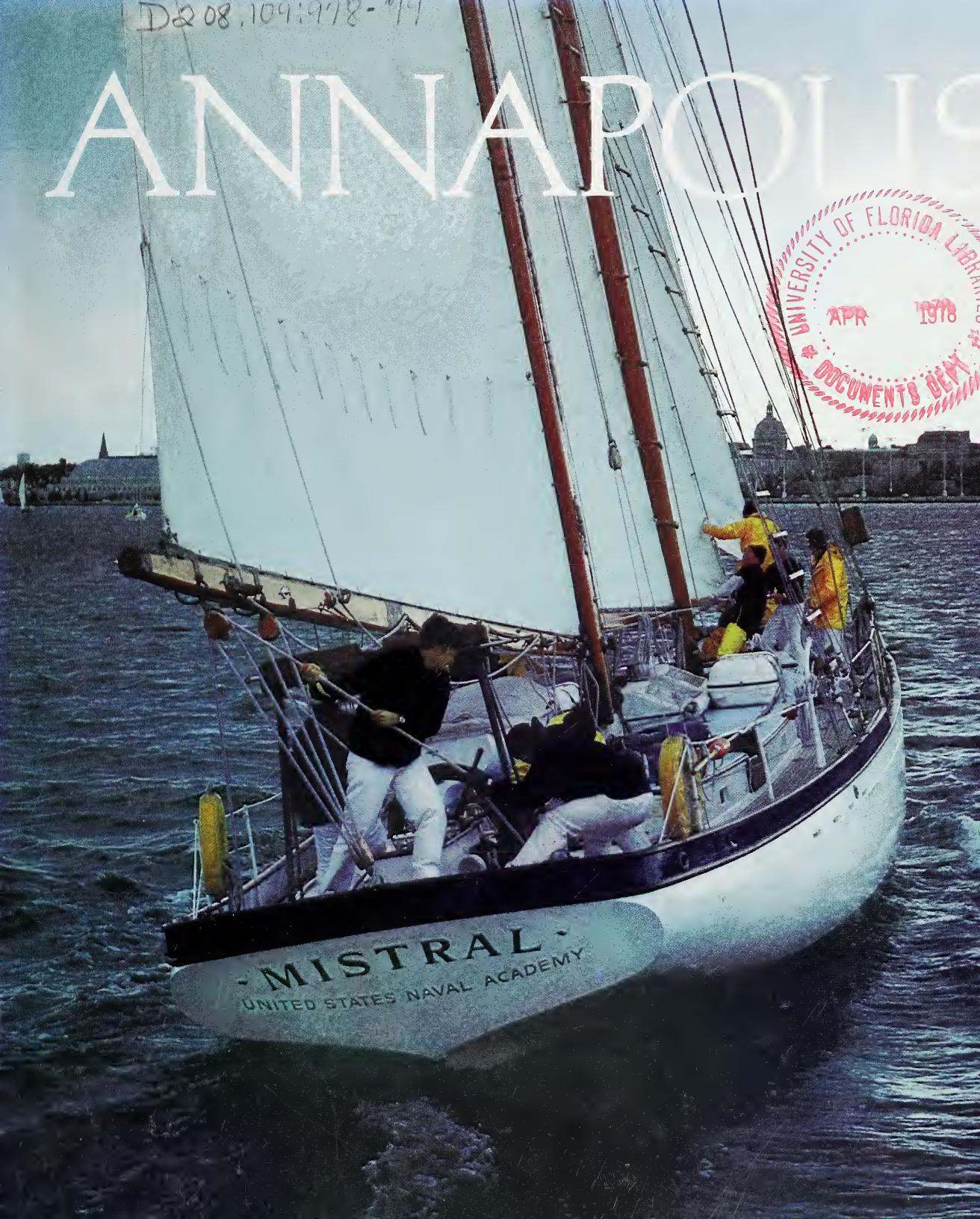


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# ANNAPOOLIS



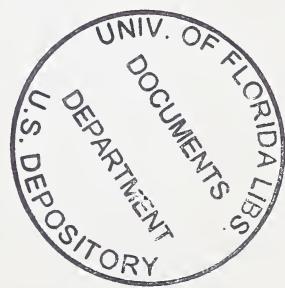


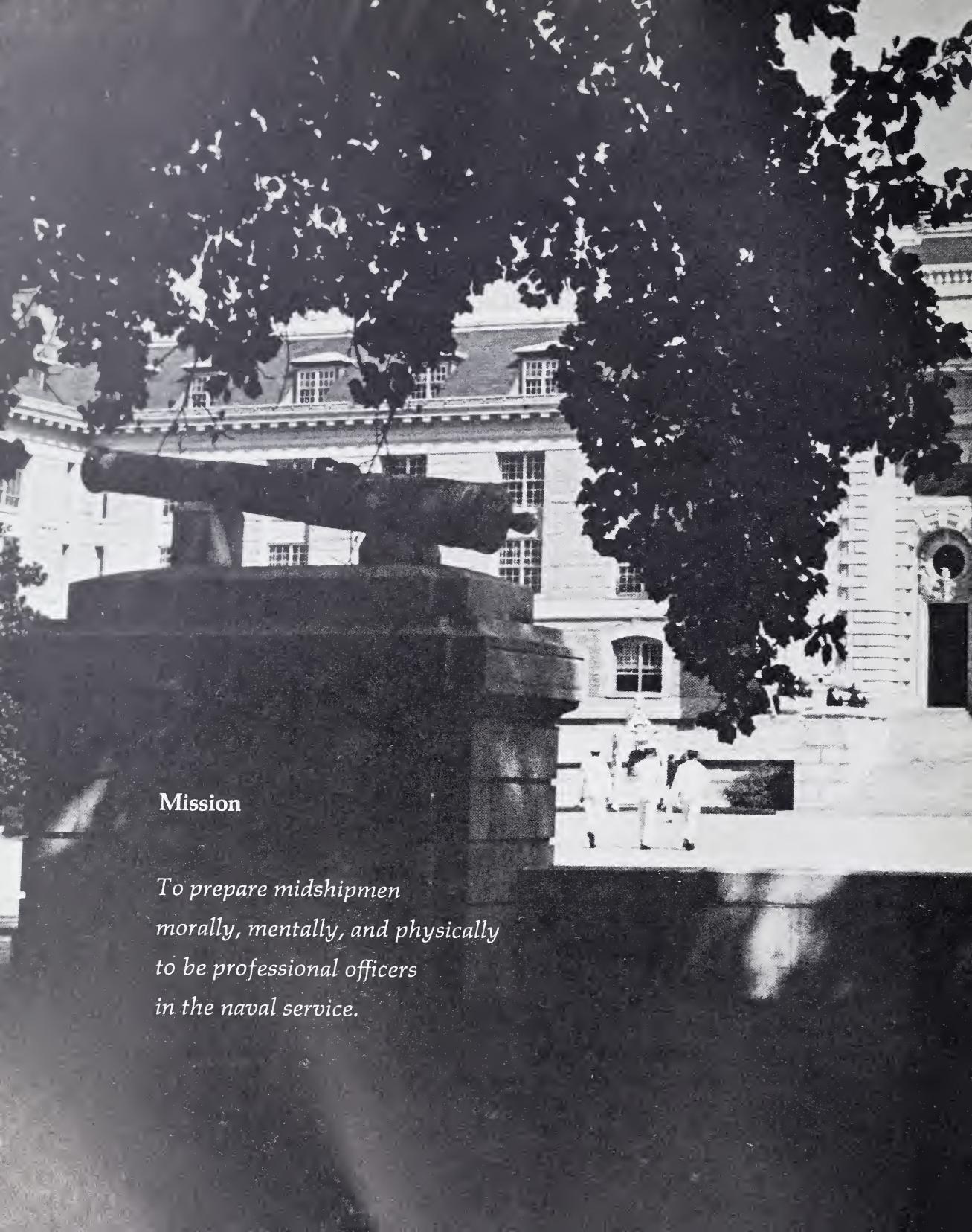
# ANNAPO利S

The United States Naval Academy

Catalog 1978-1979

FLARE





## Mission

*To prepare midshipmen  
morally, mentally, and physically  
to be professional officers  
in the naval service.*





# Maximize Your Options:

One of our most successful midshipmen, who could have gone to nearly any school in the country, told us that he chose the Naval Academy because it "offered the most options." He read our catalogue, as you are doing, and realized that he could major in a subject which interested him, play any one of 22 varsity sports against the best teams in the country, and receive a fine education and a commission in either the Navy or the Marine Corps. He could then serve in the air, on the sea, on the ground or under the sea. He could become a skilled naval officer or marine and at the same time prepare himself, through further education and training, for professional service assignments ashore. The Naval Academy meant maximizing his choices as he went along with new and exciting options opening before him all the way.

This opportunity can be yours if you have had a good secondary school education, have done well in the opportunities open to you both in and out of school, are physically active and seek challenge. If you are a woman, you are not permitted by present law to serve in Navy ships other than hospital ships and transports or in aircraft on combat missions, but the other options open to men are yours as well.

Leadership, scholarship, fellowship; this is the Naval Academy. Is it for you?



KINNAIRD R. MCKEE  
Vice Admiral, U. S. Navy  
Superintendent



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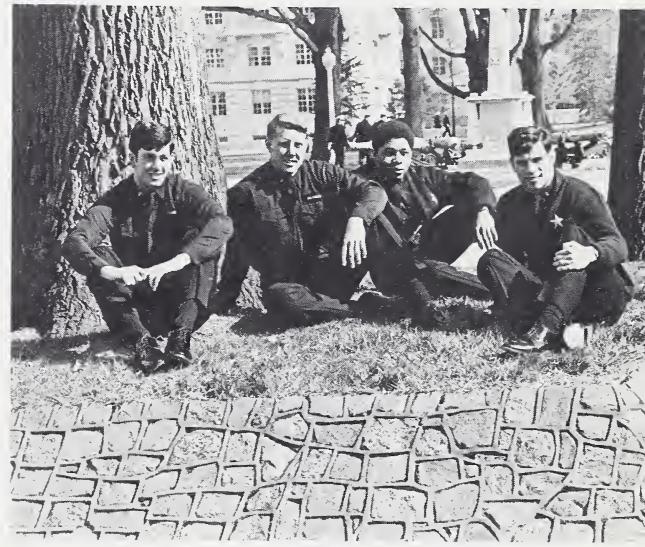
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# U.S. NAVY



**ENLIST IN THE NAVY**  
Navy Recruiting Station

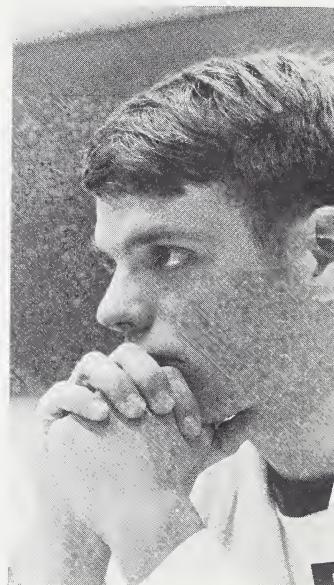


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# Why the Naval Academy?

## *Time Hasn't Changed Our Mission*

If you have picked up this catalog and thumbed through it this far, presumably you have at least some interest in the Naval Academy. Perhaps it is only a fleeting one prompted by curiosity. Or, conceivably, your interest could be a deeper one and you could be thinking of attempting to obtain an appointment to the Academy. In any case, it is reasonable that you should want to ask questions about it. What can Annapolis offer me that other schools cannot? What will the Naval Academy expect of me? What will I get out of it in the long run? In short, why should I consider the Naval Academy in making my plans for the years ahead? The paragraphs below are an attempt to provide brief, objective answers to those questions.



### Service to Country

We should be frank about this from the beginning. The purpose of the Naval Academy is to prepare young men and women to become professional line officers in the Navy or Marine Corps. Nothing else. But no one asks that you come to Annapolis with your mind made up that you want to be a career officer in the naval service. This commitment, if it is to come, develops in due time. It is considered necessary, however, that you arrive here free of preconceived goals toward some entirely different area of endeavor. If your primary interest lies in such fields as medicine, law, education, nursing, the ministry, ecology, etc., the Naval Academy is simply not the place for you.

Before deciding to come to Annapolis, you should clearly understand and accept that you will be educated and trained here for service to your nation. You should be prepared to undertake the challenges of the four-year curriculum, and to serve as an officer in the Navy or Marine Corps for five years after graduation. And you should have an open mind as to your future after that five years. Dedication to the idea of service to your country must be high in your reasons for coming to Annapolis if you hope to succeed, and if you are to fully justify taking your place in the entering class.

*"The arts of leadership and discipline are synonymous. No man is worth his salt without self-discipline."*

ADMIRAL JOHN S. McCAIN, JR.



*"This was a great opportunity . . . quite an exposure. Every school I've gone to is black. Everything around me was black. I had never thought of how I would react if I was suddenly thrust into an almost all-white environment."*

## Education

A sound college education is the foundation for every profession in our society. The naval profession is no exception. The Naval Academy, since its founding in 1845, has been dedicated to providing a sound education for its students. In recent years, the growing complexity of the Navy, both in its internal technology and in the nature of its outside relationships, has changed the requirements for the undergraduate education of its officers at Annapolis.

Professional, seagoing, shipboard subjects are still required of each graduate, but, beyond these, each midshipman may now choose from many areas of study, ranging from engineering through oceanography, and mathematics on to history, economics, and political science. The needs of the Navy require that at least 80 percent of the midshipmen in each class be enrolled in engineering, scientific, or mathematics majors. Other midshipmen may major in the humanities or social sciences. Whatever your major, you will find yourself well prepared at graduation to serve as a *line* officer in any of the principal warfare specialties.

## Leadership Training

The Naval Academy does much more than simply offer you a sound college education. Its program includes military training, physical training, and the inculcation of the ideals of the naval profession. The purpose of the overall program at Annapolis is to produce self-confident leaders who accept and are fully ready to carry out their responsibilities both to the nation they serve and to the men and women entrusted to their command. This is not an easy goal and no one should come to the Naval Academy with the idea that the training program is a spare-time adjunct to the educational program. It is all-encompassing and its activities pervade the four-year course through all the months of the year.

Thus, you should fully appreciate that the ultimate objective of the leadership training that begins here at Annapolis is to produce officers who can rise to command—*professional* officers who are physically strong and mentally competitive and who have a solid technical foundation. Officers of unflinching honesty and forthrightness, with total commitment to high standards of honor, duty, and responsibility. Officers who relish a challenge and thrive in accomplishment.

Characteristically, President Harry Truman cut to the essence of command when he observed, "The buck stops here." Perhaps the finest description of what the responsibility of command is all about, however, and still remarkably appropriate today, was written by English sea captain and writer Joseph





*'Being a woman is a terribly difficult trade, since it consists principally of dealing with men.'*

JOSEPH CONRAD

Conrad: "In each ship there is one man who, in the hour of emergency or peril at sea, can turn to no other man. There is one who alone is ultimately responsible for the safe navigation, engineering, performance, accurate gunfire, and morale of his ship. He is the commanding officer. He is the ship."

### Years at Annapolis

The plebe year at Annapolis is tough. It is a year of academic and professional development in a new and different environment. You will certainly feel pressure and stress in the process and will find it necessary to learn to utilize time better than you ever have before. The challenge will be total: mental, moral, and physical. For the entire year.

Beyond plebe year, the Academy applies its regulations and its system of accountability to you with decreasing severity until, during your first class or senior year, you will have a great deal of freedom in choosing what you will do and where you will go. Along with that increased freedom, however, will come increased responsibility. The first class, and particularly the midshipmen officers chosen from the first class, are charged with much of the responsibility for running the Brigade. Student government was a reality at the Naval Academy long before it was being discussed at most other institutions.

Your four years at Annapolis will not be easy ones. No achievement so worthwhile is ever easy. And few achievements are so satisfying. By the time you graduate, you will have developed your potentials of scholastic achievement, physical condition, and leadership ability to the best possible advantage.

### Travel and the Sea

The Naval Academy is linked with the sea through its history, its mission, its day-to-day work, and its future. As you stroll through the Academy Yard, you can see ocean-going ships in the Chesapeake on their way to and from Baltimore. Whatever the month, you will usually see part of the Academy's fleet of more than 100 small-craft—sail and power—underway in the Severn River or on the Bay.

Perhaps you have never thought much about the sea; perhaps you have lived near and known it well all your life; perhaps you have never known much about it but it has always spelled adventure, travel, and excitement for you. Whatever your situation, you should not think seriously about Annapolis without also thinking about the sea.

Two of your four summers at the Academy—there are currently certain

statutory combatant-ship restrictions for women midshipmen—will be devoted to cruises in ships of the Navy. After your plebe year, your youngster cruise may take you to distant ports in Europe or the Far East. Recent Academy cruises have gone to a number of Mediterranean and Northern European countries, while the Pacific groups have visited Hawaii, Australia, Japan, and Hong Kong.

On these cruises you will stand the crew's watches on your ships, applying much of what you have learned in your professional courses during plebe year. Similarly, when you go on your first class cruise the summer before your last year at the Academy, you will have an opportunity to stand the watches of a junior officer, applying again a portion of your professional training and education. And, once again, you may visit ports in Europe or the Far East.

These ties between practical work at sea and academic work at Annapolis are symbolic of the balance between training and education that is at the heart of the Annapolis program.

## Professionalism

This is the word used at Annapolis today to express the overall excellence that has been our ideal since the founding of the Academy more than a century and a quarter ago. It expresses many things—but at the heart of it is the desire for service to country with which this chapter started. The midshipmen themselves have a good phrase they use when asked if a particular person should come to the Academy. They say, "You have to want it." That really says it all.

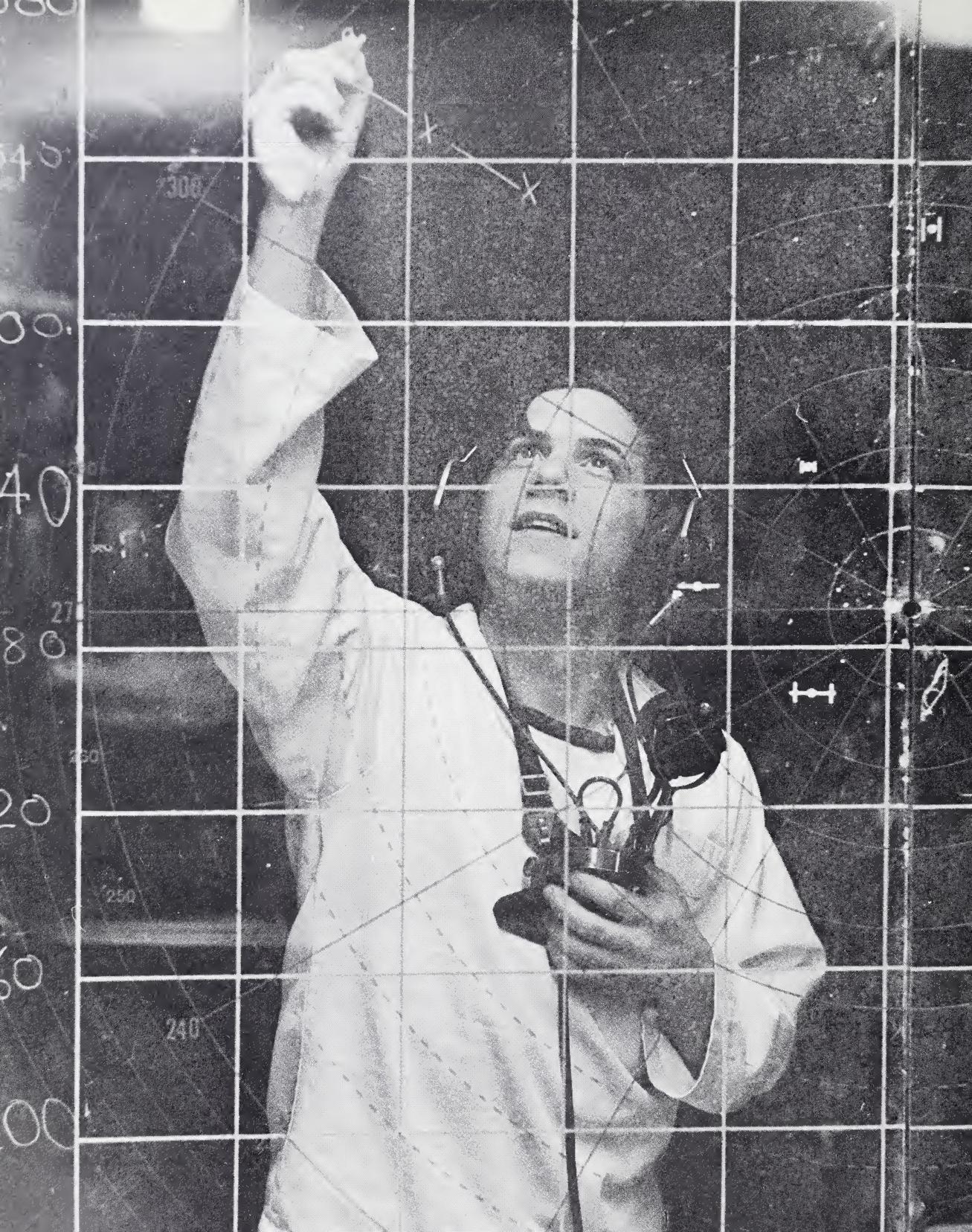
It's up to you.



*"It cannot be too often repeated that in modern war, and especially in modern naval war, the chief factor in achieving triumph is what has been done in the way of thorough preparation and training before the beginning of war."*

THEODORE ROOSEVELT





## The Years 1845-1978

Through the years 1845 to 1978, as the nation's responsibilities and need for seapower have grown, the Navy has increased greatly in size and complexity. Keeping pace, in peace and war, from sail to steam, and into the nuclear age, the Naval Academy has responded to every challenge, improving its facilities and revising its curriculum as necessary to provide the timely, second-to-none professional leadership expected in the United States Navy.

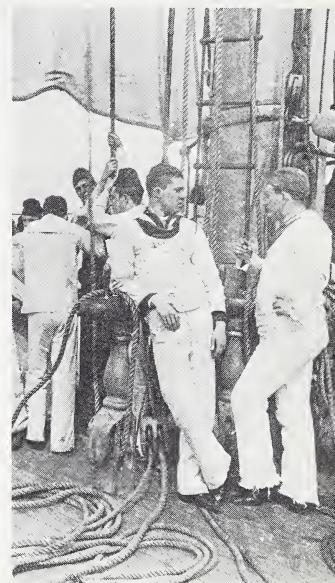
The Naval Academy was founded as the Naval School in 1845 by the Honorable George Bancroft, distinguished historian and educator, and Secretary of the Navy in President James K. Polk's Cabinet. It was located in Annapolis, Maryland, on the 10-acre site of the Army's nearly abandoned Fort Severn, where the Severn River empties into the Chesapeake Bay.

Commander Franklin Buchanan was the first Superintendent of the Naval School. His seven-member faculty of four officers and three civilians taught gunnery, naval tactics, engineering, chemistry, mathematics, astronomy, French, and English. The course of study was five years: the first at Annapolis, three at sea, and back to the School for the fifth. Sixty midshipmen, comprising two classes, attended the Academy's first convocation.

In 1850-51, the Naval School was reorganized as the U. S. Naval Academy, the Board of Visitors first met at the Academy, and the course of study was reduced to four academic years. Summer training cruises provided the midshipmen with seagoing experience to augment their classroom work. Thus, the forerunner of today's basic four-year curriculum and summer cruise program first appeared at the Naval Academy well over 100 years ago.

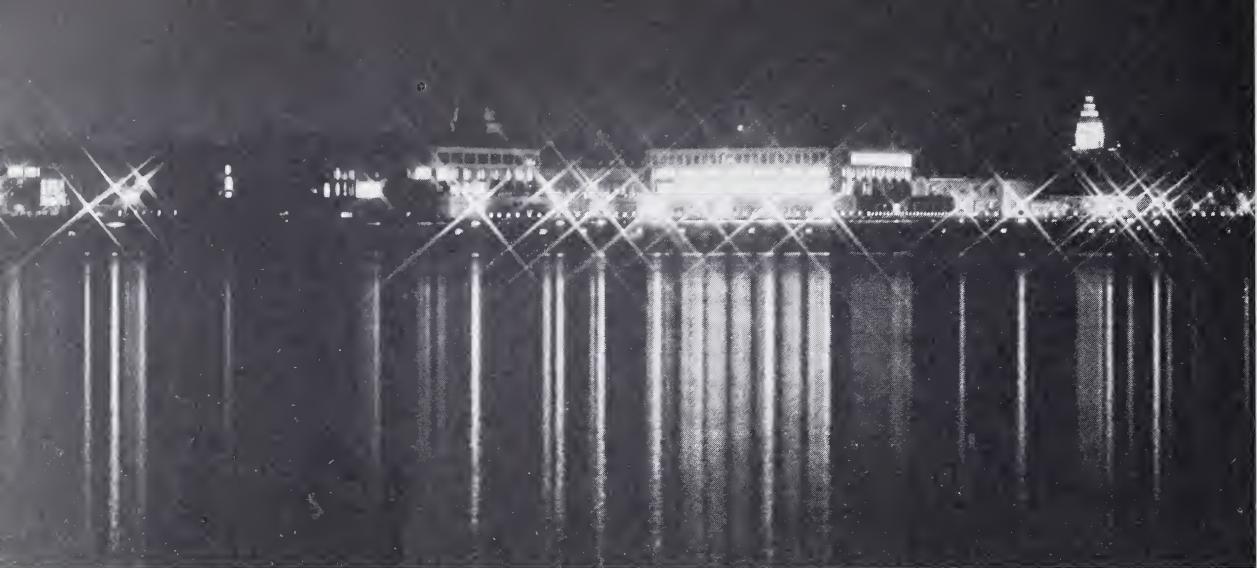
During the Civil War, the Brigade of Midshipmen was moved temporarily to the more secure surroundings of Newport, Rhode Island. Following the war, the Brigade returned to Annapolis to stay. During these early years, the Academy was one of the few institutions in America offering a sophisticated, technical undergraduate program.

In the late 1870s, Albert A. Michelson, a graduate of the Class of 1873,



*"The pathway of man's journey through the ages is littered with the wreckage of nations, which, in their hour of glory, forgot their dependence on the sea."*

J. D. HITTLE



*No man who is  
occupied in doing a  
very difficult thing,  
and doing it very well,  
ever loses his self-  
respect."*

GEORGE BERNARD SHAW

performed his world-famous measurement of the velocity of light while serving as an instructor in the Department of Physics and Chemistry at the Academy. Michelson continued his brilliant scientific work after leaving the Navy, and, in 1907, he became the first American scientist to receive a Nobel Prize. The supreme compliment was paid by Albert Einstein who once noted the considerable debt that his theory of relativity owed to Michelson's earlier work. It is not surprising that the science wing of the Academy's science and mathematics complex is named Michelson Hall.

Another distinguished graduate was Alfred Thayer Mahan, whose profound writings on seapower and its influences on history are still the world standard in the field. Beginning in 1883, Marine officers were commissioned from the Academy and joined the succession of graduates who have served with distinction in peace and war for over 100 years. Admirals Dewey, Sims, King, Nimitz, Halsey, Spruance, and Burke and Marine Commandants Lejeune, Russell, Greene, and Cushman have earned their place in history. So, also, have astronauts Shepard, Schirra, Lovell, Carr, Stafford and Anders. Admiral Hyman G. Rickover, 1922 graduate of Annapolis for whom Rickover Hall, our newly completed engineering complex has been named, has personified the Navy's nuclear power program for a generation. And, highest honor of all, a 1946 graduate, President Jimmy Carter, holds the world's attention and the hopes of his countrymen for leadership in these difficult times as America's 39th President. The successors to these graduates, preparing to meet a new generation of challenges, are midshipmen today.

Following accreditation of the Naval Academy in 1930 by the Association of American Universities, a Congressional law was passed in 1932 authorizing



the Academy to confer the Bachelor of Science degree upon all graduates, beginning with the Class of 1931. In 1939, Congress authorized the awarding of the B.S. degree to all living graduates. The Middle States Association of Colleges and Secondary Schools first accredited the Academy in 1947. And, in 1958, tests of the College Entrance Examination Board replaced Academy-prepared entrance examinations. Since 1970, candidates have had the option of taking the CEEB tests or the American College Testing Program test for entry.

An Academic Advisory Board of distinguished Americans, formed by the Secretary of the Navy to advise and counsel the Superintendent on academic matters, first met at the Academy in 1966.

On 8 October 1975 President Ford signed historic legislation authorizing the admission of women to the service academies "consistent with the needs of the services." The Naval Academy admitted its first women midshipmen (81) on 6 July 1976.

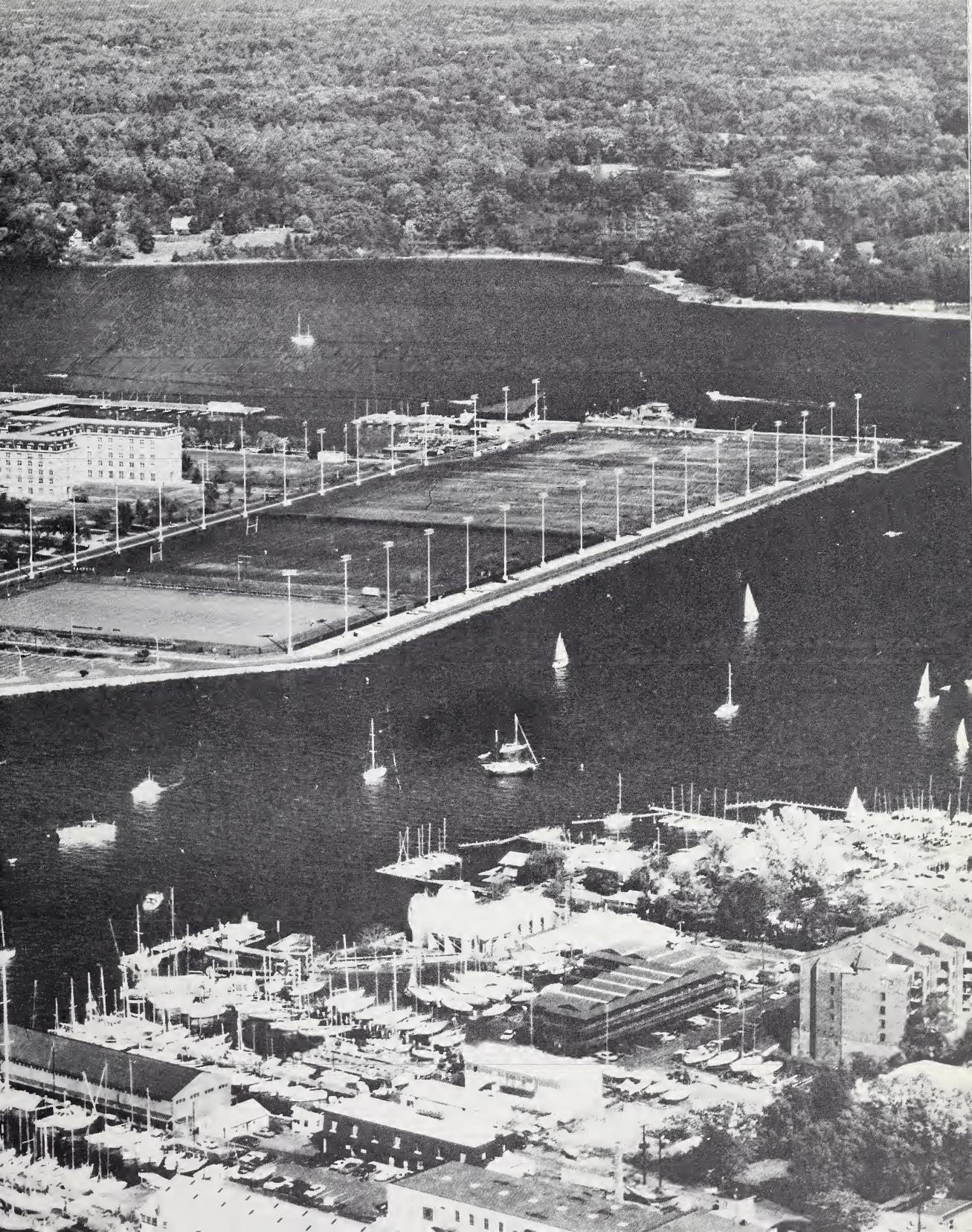
*"Education is the instruction of the intellect in the laws of nature."*

THOMAS HUXLEY

## **Yard and Facilities**

Long recognized as one of the most beautiful of our historic landmarks along the eastern seaboard, the Naval Academy was designated a U. S. National Historic Site in 1963. Each year over one million visitors tour the grounds and buildings of the Academy. Everyone is welcome during daylight hours, and a visitors' service providing guided tours, maps, and information is available. Annapolis is less than an hour's drive from Washington, D.C., or Baltimore, Maryland.







*"It was snowy and bleak, no leaves on the trees . . . I went to a class and saw a closeness between the professor and student, an English class, not my best subject, but it was informal and I learned a lot just sitting there. That impressed me."*

Physical and academic facilities have kept pace with the demands of the curriculum and the Fleet. The original ten acres have grown to today's 329 acres. Much of this new acreage has resulted from a series of landfills in the Severn River. A landfill completed in 1959 added 56 acres for athletic fields and new buildings. Construction of a number of buildings in use today, including our chapel, several academic buildings, and core areas of Bancroft Hall, the midshipmen's dormitory, began in 1899 with a Congressional appropriation of ten million dollars. Ernest Flagg was the architect; the style is French Renaissance.

Ensuing years have seen the addition of new wings to Bancroft Hall, the midshipmen's dormitory; the construction of a Brigade assembly hall; the construction of Halsey Field House; and the construction, with privately donated funds, of the nearby Navy-Marine Corps Memorial Stadium. A multimillion-dollar renovation of Bancroft Hall was completed in 1965.

Beneath the chapel's towering dome, lies the crypt of John Paul Jones, "the father of the American Navy." Throughout the Yard stand other monuments and mementoes commemorating the deeds of our great naval heroes and honoring the Navy's finest traditions.

Currently, a seventy-three-million-dollar, campus-wide construction and rehabilitation plan is nearing completion. Key structures in this plan include



the science building, Michelson Hall, and the adjoining mathematics building, Chauvenet Hall, both completed in 1968. The 650,000-volume capacity Nimitz Library, overlooking the Severn, was completed in 1973. An adjacent engineering building and laboratory complex, Rickover Hall, was completed in 1975. New-to-the-walls interiors, including completely modern classrooms and laboratories, have been provided in Maury, Sampson, and Luce Halls. A full range of facilities and services for student and faculty research, computer-aided education, and educational television is available throughout the academic complex. All academic areas are air-conditioned.

Recently, privately donated funds from friends and alumni have given us our Robert Crown Center, home of the Intercollegiate Sailing Hall of Fame and new waterfront headquarters for our sailing program, and a beautiful activity center (student union) which includes an indoor ice skating rink, a cafeteria, lounges, and game rooms.

The center for daily living is Bancroft Hall, one of the largest dormitory complexes in the world. Stretching over many acres, it houses the entire Brigade. All of the basic facilities for daily living, as well as many for recreation, are found in Bancroft Hall.

*"I really felt strange after becoming a qualified marksman, knock-about sailor, motor launch operator, and yawl crew member in my first 60 days. And it was all free. What civilian college could offer me that?"*



# III

## Life at Annapolis

### Mission

The Naval Academy is charged with the responsibility of preparing midshipmen for service as commissioned officers in the U. S. Navy or Marine Corps. In fulfillment of this responsibility, the staff and faculty must ensure not only that the academic program is of the highest quality but also that midshipmen are prepared morally and physically for the rigors of commissioned service. This is a threefold mission that requires careful organization and a clear set of priorities.

During the academic year, first priority is given to studies, and each midshipman has ample time for out-of-classroom study and research. On weekdays, following the last class of the day, midshipmen participate in intramural or varsity sports and other extracurricular activities.

During the summer months, the emphasis swings to professional training, and upperclassmen engage in a program of summer cruises at sea or in indoctrination visits and training at selected naval shore activities. Upperclassmen also enjoy an extended leave period during the summer.

### Organization

To accomplish the uniquely military aspects of the Naval Academy's mission, the student body is organized into the Brigade of Midshipmen. The Commandant of Midshipmen, a rear admiral or a senior Navy captain, commands the Brigade. He is responsible for instilling high ideals of duty, honor, and loyalty; for providing military indoctrination and physical development; and for inculcating midshipmen with the desire to achieve the high standards of performance required of midshipmen and officers of the naval service. In carrying out these responsibilities the Commandant is assisted by an immediate staff of officers, designated the Office of the Commandant, and by five subordinate departments or groups of officers. The departments reporting to



*"Here you're forced to mingle with whites . . . forced to communicate . . . We get together and we get the job done."*



*"How many college sophomores get to go to Europe or the Far East as part of their education?"*

the Commandant include the Division of Professional Development, the Physical Education Department, the Midshipman Supply Department, the Brigade Chaplains, and the Brigade Officers.

The Brigade Officers consist of six battalion officers, officers of the grade of Navy commander or Marine Corps lieutenant colonel, and 36 company officers composed of Navy lieutenants and lieutenant commanders and Marine Corps captains and majors. These officers work in close daily contact with the midshipmen in Bancroft Hall. Here, by precept and example, the application of sound techniques of leadership, counsel, and guidance, and, when required, corrective or disciplinary action, midshipmen are measured, molded, and motivated for the day when they will join the Navy or the Marine Corps as commissioned officers.

Bancroft Hall houses the entire Brigade of Midshipmen. The majority live two or three to a room. In each of the thirty-six company areas in Bancroft Hall there is a company wardroom for informal meetings, reading, or relaxing while watching television. The Midshipmen's Wardroom, a large dining hall in Bancroft Hall, accommodates the entire Brigade, family style, for meals. Also included in Bancroft Hall are small Catholic and Protestant chapels, with chaplains' offices adjoining, a midshipmen's store for daily necessities and an occasional gift, tailor and uniform shops, three barber shops, a bookstore, a cobbler shop, a post office, recreation rooms, a bowling alley and a snack bar, the "Steerage." On weekends, Memorial Hall, Smoke Hall, and the adjacent activity center in Dahlgren Hall provide attractive settings for dances and other recreational activities.

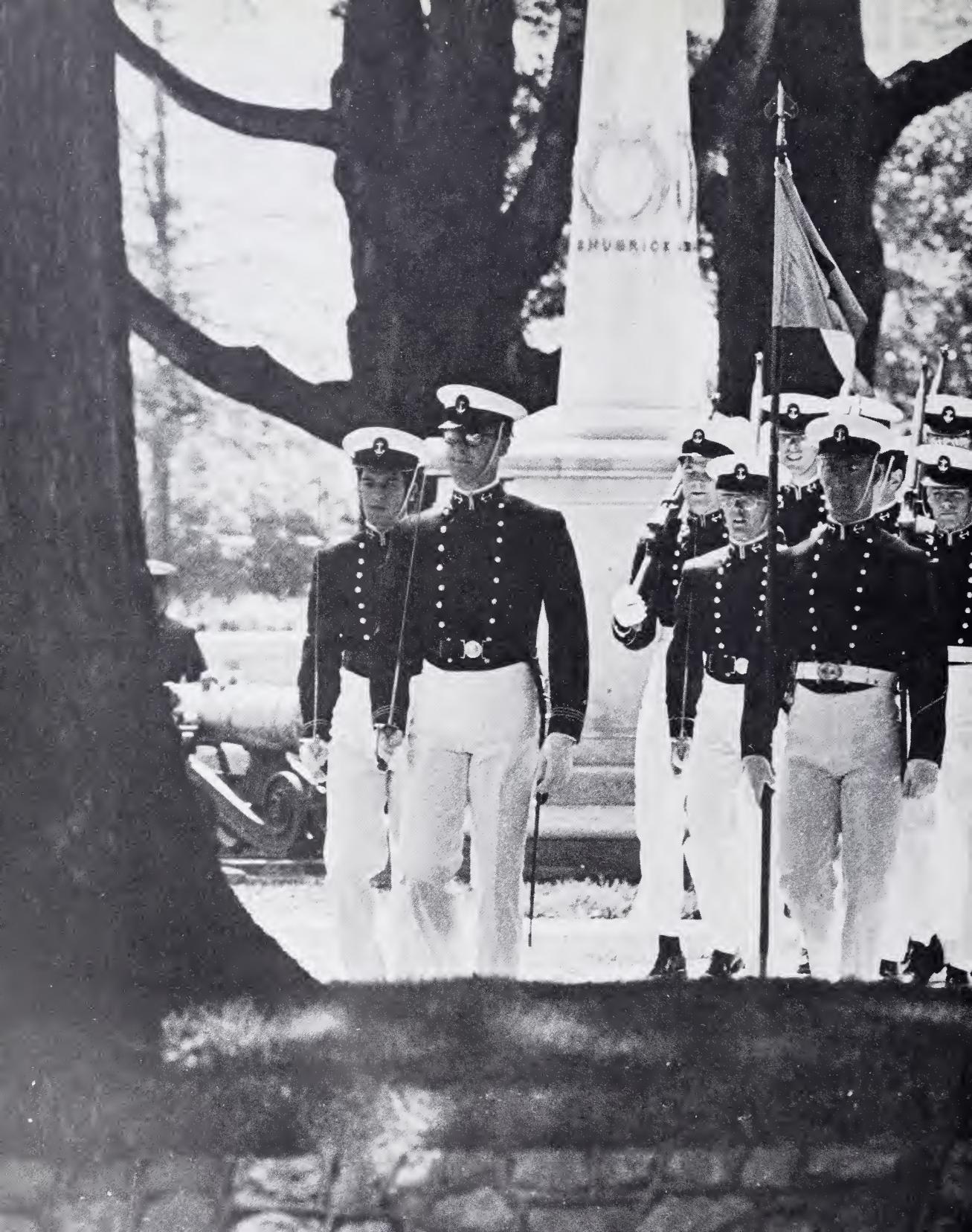
For purposes of military training and administration, the Brigade of Midshipmen is divided into two regiments, each of which is divided into three battalions. The six battalions are each divided into six companies. Midshipmen of all four classes are assigned to each company—the basic military and organizational unit for numerous competitive activities during the year.

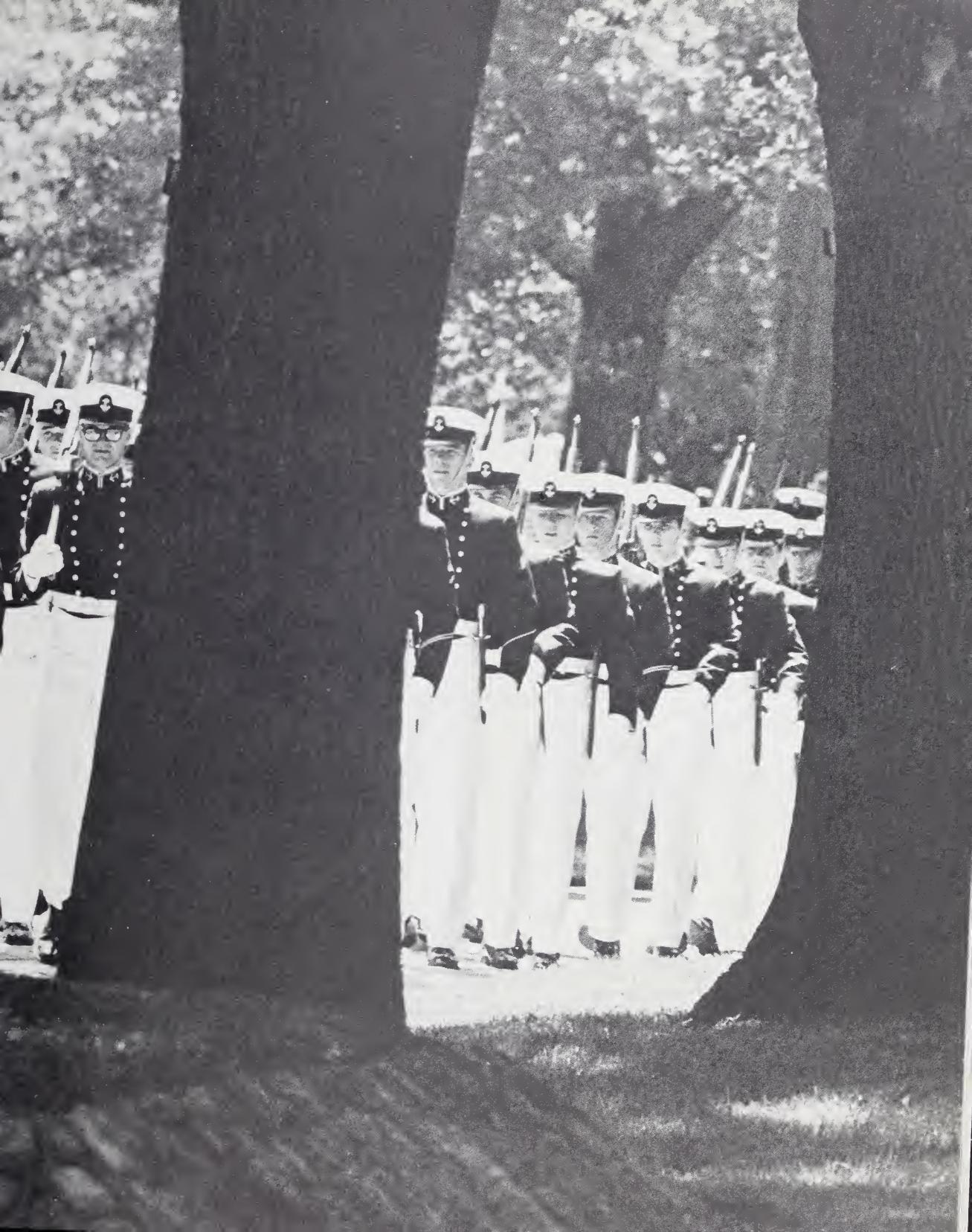
Each of these military units, from the Brigade down to the 36 companies and their subordinate platoons, is under the command of a midshipman first class, aided by his midshipmen staff and assistants. Midshipmen are selected for these commands and staffs on the basis of their demonstrated proficiency in leadership and their other officer-like qualities.

## Years of Development

The incoming midshipmen are officially designated midshipmen fourth class, but are traditionally known as plebes. In succeeding years, they become third classmen or youngsters, then second classmen, and finally, in their senior year, midshipmen first class.









**Plebe Year.** The new midshipmen undergo a comprehensive program of military training and indoctrination from their first day in early July until the end of their plebe year the following June. Demands upon them and upon their spare time, all with good reason, seem never-ending. Midshipmen quickly learn during this period that they are learning subordinates, under close supervision and careful guidance. Plebe indoctrination is administered by midshipmen of the first class, assisted by the second classmen, and closely supervised by the Commandant and the Brigade Officers.

Although some form of military training is found at many American colleges and universities, the rigorous routines and challenges of a plebe indoctrination system are unique to the Service Academies. Complementing other phases of midshipmen training and education, the system directly supports the Naval Academy's mission by developing leadership abilities and a basic understanding of military relationships and the military environment. Its aim is to teach each plebe to:

**Exercise self-discipline,  
Organize his time and effort effectively,  
Perform efficiently under stress,  
Think and react quickly with good judgment,  
Exhibit an exemplary military bearing and appearance.**

Plebe year is designed to test and develop. It is a demanding period of testing, requiring midshipmen to stand on their own feet, to produce under pressure, to respond promptly and intelligently to orders and, finally, to measure up to the highest standards of character, honor, and morality.

The first day of plebe summer is a day that most midshipmen will remember for many years. This is scarcely surprising, for in one short day, civilians become midshipmen. They are given haircuts, issued uniforms, taught the basics of marching, and served their first meal in the vast Midshipmen's Wardroom in Brancroft Hall. Their military indoctrination gets off to a fast start, but they are too busy to have time to worry about it. Civilian ways and days soon seem far behind.

As the summer progresses, the new midshipmen rapidly assimilate basic skills in seamanship, navigation, and signaling. Infantry drill, firing a .45 calibre pistol, sailing Navy yawls, and participating in a rigorous physical conditioning program contribute to making each midshipman a proudly versatile individual. Team spirit and the desire to win are developed through competition in a wide range of activities, including athletics, dress parades, seamanship, and talent shows.

*"Discipline is the soul  
of an army. It makes  
small numbers formida-  
ble; procures success to  
the weak, and esteem  
to all."*

GEORGE WASHINGTON









Plebe summer terminates in mid August with Parents' Weekend, when parents of the new midshipmen have the opportunity to visit the Academy and enjoy the weekend with their sons and daughters. A dress parade, exhibitions in sports, dining and sailing with the midshipmen, and the opportunity to meet the faculty and company officers help to assure parents that their sons and daughters are taking their new life as midshipmen in stride.

Upperclassmen return from at-sea training, leave, and other summer activities the following week. Plebe summer is over, but plebe indoctrination continues. The academic year gets underway. Four years of studies have begun, paced by a demanding daily schedule . . .

6:15—Reveille

6:45-7:10—Breakfast (optional for midshipmen first, second and third class)

7:15-7:30—Special instruction period for midshipmen fourth class

7:35—Quarters for muster and inspection

7:55-8:45—First period

8:55-9:45—Second period

9:55-10:45—Third period

10:55-11:45—Fourth period

12:10—Call to noon formation

12:20—Noon meal

1:15-2:05—Fifth period

2:15-3:05—Sixth period. (With the exception of a few midshipmen having a seventh period laboratory, midshipmen utilize the time from the end of the sixth period until evening meal formation to participate in varsity and intramural sports and other extracurricular and personal activities.)

6:30—Evening meal formation

8-11—Study period

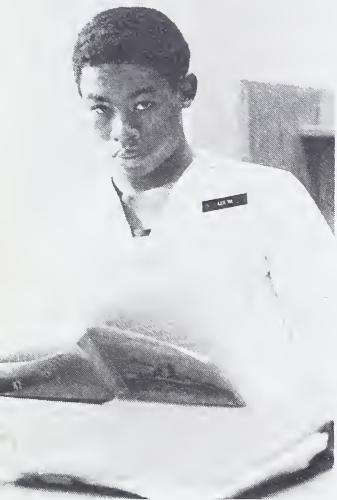
11—Taps

September brings the excitement of football and other fall sports. During the football season, selected units of the Brigade travel to out-of-town games. The entire Brigade attends home games, and, at the end of the season, travels to Philadelphia for the annual donnybrook with the Black Knights of the Hudson, the cadets of West Point.

December examinations end the first semester and midshipmen depart on Christmas leave. This provides plebes with the first opportunity to visit their homes since their arrival at the Naval Academy in July, and gives all midshipmen a welcome break in the academic routine. Leave ends and classes resume in mid-January. Later in January, following extensive counseling, plebes begin selecting their majors. Mid-term examinations in early March are followed by a week of leave for all classes. Studies end with examinations

*"Nothing here is easy  
for anyone, but nothing  
is so hard that it can't  
be done."*





*"We must remember that one man is much the same as another, and that he is best who is trained in the severest school."*

THUCYDIDES

in mid-May. Following a short leave, midshipmen return for graduation ("June Week") the last week in May.

The approaching end of plebe year brings mixed emotions. A feeling of relief that it is almost over—yes; yet, at the same time, there are well-deserved feelings of confidence and pride that the challenge has been met.

**Third Class Year.** At the end of June Week, the first year of intensive indoctrination is ended and the new third classmen depart on six to eight weeks of training at sea with the Fleet, accompanied by midshipmen of the first class. At-sea training is followed by 30 days of leave.

During their first taste of life at sea in the Navy, the midshipmen come to know and respect the Navy's enlisted men whom they will later command and upon whom they will depend as officers. They serve in many capacities and actively participate in a wide range of shipboard operations. They stand deck, gunnery, operations, and engineering watches; operate ship's boats, and exercise at general shipboard drills.

With the completion of at-sea training and summer leave, third classmen return to the Academy for their second academic year and begin work in their majors. And, although the new year brings more responsibilities in infantry drills and in watch-standing, the lessened emphasis on indoctrination leaves more time for studies and for sports and other extracurricular activities. It is a welcome and deserved change!

Following the completion of academic studies of their third class year and the end of their second June Week, the third classmen become second classmen.

**Second Class Year.** During a fast-moving summer, second classmen undertake professional studies at the Naval Academy and receive familiarization training in the warfare specialties of the Navy and Marine Corps. In New London, Conn., each receives an introduction to the submarine service through lectures ashore and through visits and short cruises on board nuclear submarines of the U. S. Atlantic Fleet. Traveling to Newport, Rhode Island, the new second classman attends a familiarization course at the Navy's Surface Warfare Officers' School and visits modern destroyers. Flight indoctrination in naval training and operational aircraft at Pensacola, Florida, provides a knowledge of the duties of an officer choosing a career in naval aviation. Introduction to the techniques of vertical envelopment and amphibious assault, provided by the Marine Corps at one of their major training facilities, completes the summer's professional training.

Following summer leave, still greater military responsibilities become theirs as second class midshipmen return to the Academy for their third academic year, and enter into increasingly advanced areas of study in their majors.













*"You have to give some things up if you come here. You don't have much of a social life in your first year. You can't wear your hair as long as you want to. And you have to give up some of your personal freedom. In a military environment you can't just go and come as you please."*

Midshipmen officers are selected and trained to direct the Brigade during periodic absences of the first class. An important role in the indoctrination of the new fourth class is undertaken by the second class. In addition to contributing to the development of the fourth classmen, this responsibility makes a vital contribution to the second classmen's growth as leaders. There is little time for watching the calendar. And, before long, another June Week has come and gone, and first class year is underway.

**First Class Year.** During their last summer, first classmen go to sea for training with the Fleet for their second and last time as midshipmen. Here, they have the opportunity to assume the responsibilities and perform the duties of junior officers. A number of carefully chosen members of the first class will also take part in the training and indoctrination of the new plebe class at Annapolis during the summer.

On board the cruise ships, functioning as a junior officer, the first classman is exposed to the social courtesies, amenities, and customs of wardroom life. Work in navigation, watch-standing on the bridge, exercises in the combat information center and in the engineering spaces, and lectures and studies on other aspects of shipboard life complete the summer's training with the Fleet.

Normally, midshipmen visit a number of foreign lands and ports during their training cruises with the Fleet. Visits are made to such places as Hawaii, Japan, Hong Kong, Australia, and New Zealand in the Pacific; Gibraltar, Spain, France, Italy, and Greece in the Mediterranean; and Holland, Germany, Denmark, and Norway in Northern Europe.

At summer's end, first classmen return to the Academy to continue their academic studies—their principal responsibility throughout the four years at Annapolis—and to undertake their important new responsibilities for directing the Brigade of Midshipmen. Midshipmen officers, called stripers, lead the Brigade in parades, ceremonies, and at daily formations. They are responsible for the conduct, military smartness, and competitive records of their units. They are in charge of the midshipman watch organization in Bancroft Hall. The selection of three sets of midshipmen officers during each academic year increases the individual opportunity for this valuable leadership experience. The third, or June Week set of stripers, is selected by the Commandant from among the most capable midshipmen in the first two.

In carrying out these demanding responsibilities, the first class midshipmen find themselves calling upon all the leadership skills they have developed during their first three years. Following this final year of practical experience, they find themselves well prepared at graduation to assume their leadership responsibilities in the Navy or the Marine Corps as newly commissioned officers.



## The Honor Concept

A vital part of the professional development of a midshipman is a total commitment to high standards of honor, duty and responsibility. Unflinching honesty and forthrightness are essential elements of this commitment. The Brigade of Midshipmen lives under an Honor Concept which contributes to his development by providing the precepts which aid a midshipman in developing the highest standards of honor and personal integrity. By outlining generalized principles to live by, the Honor Concept seeks to instill in the midshipmen standards of integrity which will motivate them to make decisions consistent with the highest ideals of honor in every situation they encounter. The Honor Concept is more than an administrative device for dealing with certain conduct violations. It is an operational reality within the Brigade with each class participating through Company Honor Representatives to the Brigade Honor Committee.

The Concept does not foster the belief in the Brigade that honorable conduct is strictly associated with the Naval Academy, but rather that it is an integral part of the professionalism expected of officers throughout their careers.

*"If you tell the truth,  
you don't have to remember anything."*

MARK TWAIN







## The Professional Training Program

The Commandant directs the Academy's professional training program with the assistance of the Director of Professional Development. The program encompasses a wide range of training, studies, and drills, and is designed to provide graduates with a sound foundation in the fundamental specialized subjects and skills required of professional officers in the Navy or Marine Corps.

Over 2,000 hours are devoted to building this foundation during the four years at the Academy. Class standing at graduation depends significantly on a midshipman's professional training performance.

Included in the program are lectures, practical training, physical education, and a variety of evolutions and drills in which the midshipmen learn by doing. Progressing from basic military and naval knowledge to the presentation of more advanced information and concepts, the program supports and complements both the military life within the Brigade and the professionally-oriented academic courses. A description of the courses, drills, and training making up the professional training program begins on page 133.

*"No man needs sympathy because he has to work, because he has a burden to carry. Far and away the best prize that life offers is the chance to work hard at work worth doing."*

THEODORE ROOSEVELT

## Leave and Privileges

The amount of leave and other privileges granted midshipmen varies directly with their seniority, responsibility, and performance. First classmen not only will have more responsibility in the administration of the Brigade, but will also have more privileges.

There are several regular periods of leave of absence from the Academy during the year. These include a three-week Christmas leave, mid-term and end-of-semester leaves, and the month-long summer leave for the three upper classes.

In addition to leave, midshipmen are granted liberty in the Annapolis area. Like all other privileges, the amount varies with seniority and responsibility. Fourth classmen are granted liberty on Saturday afternoons and evenings and dining-out privileges with relatives and close friends on Saturdays and Sundays. They are permitted to have dates on at least four weekends in addition to June Week.

First, second, and third classmen have liberty on Saturday afternoons and evenings, and on Sunday afternoons. In addition, second classmen have liberty on Wednesday afternoons and first classmen have liberty weekday afternoons and on Friday evenings. Weekday liberties begin after classes are completed for the day.

Weekend liberty is granted to upperclassmen. Midshipmen third class are afforded three weekends each semester; second class midshipmen receive five each semester. First classmen are not limited in the number of weekends they are authorized to take; however, a number are required to remain at the Naval Academy during the weekend in order to carry out the administrative functions of the Brigade.



## Cultural Affairs Program

To enrich life at the Academy and stimulate a lively interest in the performing arts within the Brigade, the Cultural Affairs Program, sponsored by the English Department, offers many opportunities for midshipmen to attend the finest professional productions of dramas, operas, symphonies, and ballets in nearby Washington and Baltimore. Field trips throughout the academic year are made to the Kennedy Center and other outstanding theatres by interested midshipmen and their guests.

## Physical Education

In supporting the mission of the Naval Academy, the program of the Physical Education Department makes a vital contribution to the physical development of midshipmen. The program continues throughout the four years. All midshipmen participate.

The program's aims are to develop skill, confidence, teamwork, endurance, agility, and competitive spirit; to develop useful habits of physical fitness; to develop the capability to train and instruct others; and to develop the background and capability to withstand physical hardship. Equally important, the program aims to be enjoyable, to provide a release from the academic routine, to develop a lasting appreciation for sports in general, and to develop individual skills in carry-over sports for enjoyment after graduation.

Women participate in the same physical fitness and physical education program as the men except that some adjustments are made in the content of the program for women (no contact sports such as boxing, wrestling, etc.) and the standards to be met by women because of physiological differences.

The program gets off to a fast start during plebe summer. Preliminary testing of posture, swimming capability, and general athletic ability is followed by instruction and practice in boxing, wrestling, lacrosse, fencing, soccer, rugby, gymnastics, crew, golf, tennis, squash racquets, swimming and track.

The pace continues during the first academic year. Instruction is given in swimming, boxing, wrestling, gymnastics, golf, personal conditioning, squash

*"Keep your sense of humor, a low profile, and remember—you're a midshipman, not a woman midshipman. That doesn't mean you can't be feminine. Just be prepared to learn how to do both and when."*



racquets, soccer, tennis, and volleyball. In addition, midshipmen develop their skills in basketball, handball, and bowling, and they are tested in applied strength, agility, swimming, boxing, wrestling, gymnastics, and during a mile run and on the obstacle course.

The final three years provide increasingly advanced instruction and demanding tests. For additional details of the Physical Education Department and its program, refer to chapter 8.

## Medical and Dental Care

The finest medical and dental care is provided each midshipman. Facilities in Bancroft Hall are modern and extensive. Daily sick calls, when necessary, and periodic physical and dental examinations help keep midshipmen in excellent health. If hospitalization is necessary, there are the more complete facilities of the Naval Hospital at the Academy as well as those of the nearby Naval Hospital at the world-famous National Naval Medical Center in Bethesda, Maryland.

## Legal Assistance

Midshipmen are provided professional legal advice and assistance for problems of a personal nature by the Legal Assistance Officer in his professional capacity as a lawyer in uniform. His office is located in the Administration Building.

## Financial Advice

Midshipmen are provided financial advice on matters relating to savings, loans, insurance programs, and estate planning throughout their four years at the Academy. This is accomplished through battalion and company-size lectures and through individual counselling as needed. The Midshipmen Financial Advisor is a Navy Supply Corps officer, and his office is in Bancroft Hall.

## Religious Activities

The copper-green dome of the chapel towers over the other buildings at the Naval Academy and, in a sense, acts as a symbol of Annapolis to the outside world. This is more than a coincidence. Over the decades of our history, fighting Americans have learned by experience that there is a dimension to military leadership—both in and out of combat—which is essential to real effectiveness. This is the spiritual factor, the intangible quality we call moral courage.

*"If you would know  
the value of money,  
go and try to borrow  
some."*

BENJAMIN FRANKLIN

What is it that strengthens men and women in the daily battles of life? Where do they turn for help and reassurance in times of special stress? What makes them capable of decisions that disregard political or personal expediency? The answers to these questions vary widely among individuals who serve in the armed forces.

An awareness of the diverse concerns and needs of their subordinates both in the daily routine of life and in times of stress and danger is an essential dimension of the responsibility of being an officer. It is a major reason why the Naval Academy has long had a program designed to produce an appreciation in its graduates of the spiritual and moral dimensions of military leadership and life.

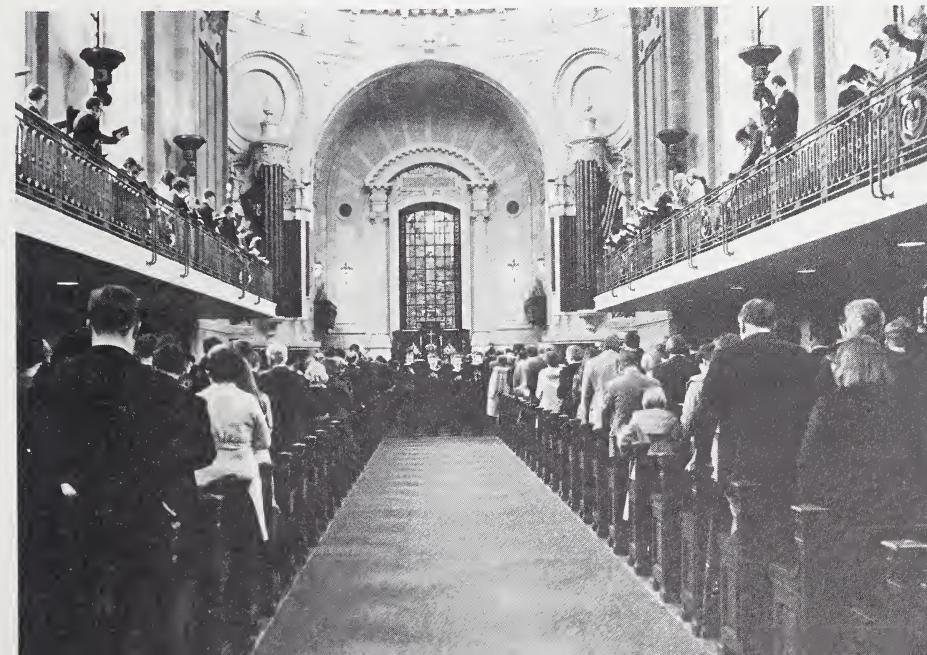
Attendance at religious services is optional. Midshipmen are encouraged to worship according to the dictates of their own consciences. They are reminded that, as officers in the naval service, their personal beliefs will often be tested, and that, in times of stress, their subordinates will look to them for spiritual as well as professional guidance. The Naval Academy believes that future officers owe it to themselves and to those they will lead to gain insights into the moral, ethical, and religious dimensions of leadership and, therefore, urges each midshipman to take full advantage of opportunities for worship and moral development.

Some midshipmen prefer a service in the tradition of their own faith pursued at a church or synagogue in Annapolis. Others select the Academy's Protestant or Catholic chapel services which periodically feature nationally famous guest preachers and lecturers. Whatever the approach chosen, midshipmen are encouraged and provided many opportunities to seek the strength and inspiration that comes from a vital relationship with God.



*"There was never yet a truly great man that was not at the same time truly virtuous."*

BENJAMIN FRANKLIN





# IV

## The Naval Profession

Ours is a complex Navy—one whose ships range every ocean, whose officers and enlisted personnel not only sail the seas but are also engaged in research from the tropics to the poles and into space, whose supersonic planes provided the training ground for America's first astronauts, whose nuclear submarines and surface ships are a testimony to America's engineering genius, whose leaders advise in the highest councils of government, and whose Marines stand second to none when tales of valor are told. Though ours is a vastly complicated and technological Navy, the human being is, in the end, all-important. It is an organization which puts a high premium on leaders with vision, dedication, and ability. It is a Navy with a proud past and a promising future, broad enough to provide a stimulating challenge in a spectrum of interesting fields.

After four intensive years of learning at Annapolis, the Naval Academy graduate will be fully ready to assume the responsibilities of an officer in the greatest Navy or Marine Corps in the world. Every graduate who is physically qualified is commissioned in the unrestricted line of the Navy or the Marine Corps. Those physically ineligible to accept these commissions may apply for a commission in various staff corps of the Navy, e.g., Supply Corps or in the various restricted line specialties, e.g. Engineering Duty.

### Assignments for Women Officers

Much of the information contained in this chapter is applicable to men only at the present time. Title 10, United States Code, Section 6015, states: "Women may not be assigned to duty in aircraft that are engaged in combat missions, nor may they be assigned to duty on vessels of the Navy other than hospital ships or transports." This means that the career pattern and duty stations of women graduates of the Naval Academy will be markedly different from their male counterparts. Although a few women may be assigned



*"Control of the seas means security. Control of the seas means peace. Control of the seas can mean victory. The United States must control the sea if it is to protect our security."*

JOHN F. KENNEDY



*"This place can be viewed as an \$80,000 education and training experience shoved down your throat a nickel at a time."*

to duty in an operational, non-combat flying status, and possibly aboard certain non-combatant ships, women may, in general, expect the majority of their assignments to be ashore.

Women accepting a commission in the Marine Corps may be assigned to any duty available to male officers, with the exception of those which might place them in a combat situation. Thus, all military occupational specialties are available to women officers except infantry, artillery, tanks and combat flying.

## First Duty

An Annapolis graduate's first career opportunity comes in the choice of duty following graduation. The priority assigned individual preferences is dependent upon a number of factors, including class standing, the needs of the Navy and Marine Corps, and the personal qualifications of the individual. Every attempt is made to assign graduates to the duty and locality requested.

Whatever the initial operational duty, officers usually find that the responsibilities assigned are greater than those of their contemporaries in civilian life. Most Naval Academy graduates are commissioned as ensigns in the line and are, thus, headed ultimately for command at sea. A large number of graduates choose to go to sea initially in a combat-type surface ship—i.e., aircraft carrier, cruiser, destroyer, or amphibious warship. Other graduates may volunteer and be selected for nuclear power training, with ultimate assignment to submarines or surface combatant ships of the Fleet.

Prospective aviators may elect to go directly to flight school or they may go to sea with the Fleet for two years before entering flight training.

Graduate programs leading to advanced degrees are available to a small number of new graduates. Normally these special programs will follow a tour of sea duty.

One out of every six Annapolis graduates may volunteer for appointment in the Marine Corps as a second lieutenant. Those accepting commissions in the Marine Corps will spend 21 weeks at the Basic School—a school for officers, run by officers. After this familiarization training, the Marine lieutenant will receive formal training in the occupational specialty he or she chooses. Career field choices include the combat arms, aviation, intelligence, logistics, engineers, air traffic control, data processing, supply and communications. Upon completion of training, the lieutenant will be assigned to a regular Marine Corps unit.

Officers not physically qualified for operational assignments are assigned to schools or shore billets which are commensurate with their abilities and desires and the needs of the service.

## Officer Career Patterns

Within the framework of the needs of the service, officers determine their own career patterns to a significant degree through their requests for assignments afloat and ashore, advanced studies, and, of course, by personal performance. After the initial tour, most young officers have a fairly well developed idea of what specialty they would like to follow. Line officers seek sea duty assignments that will prepare them for command of a surface ship, submarine, or aircraft squadron. Tours of duty ashore occur at regular intervals. Officers aspiring to command at sea will serve in a number of ships or aircraft squadrons in different capacities, as well as in staff and planning billets afloat and ashore, in the United States and overseas.

Male officers will serve their initial tours at sea aboard combatant ships. They serve in a wide variety of assignments during these tours. Women officers can expect assignment to shore commands and staffs in such diverse areas as operational analysis and planning, research and development, personnel and educational management and services, intelligence analysis, and communications.

Repeated assignments within specialized fields and graduate studies provide line officers with subspecialties which generally are exercised ashore. These subspecialties include such varied fields as ship engineering, aeronautical engineering, management, international relations, and personnel administration.

While certain aspects of the career patterns of Navy and Marine Corps officers are similar, there are some significant differences. Upon completion of the 21-week course at the Basic School and formal occupational specialty training, the Marine lieutenant can expect to be assigned to Fleet Marine Force operational units in the United States or in the Far East. During this initial tour, the Marine officer serves in command and staff positions. Following this, the Marine officer can expect assignment to jobs outside his or her specialty, such as independent duty, barracks duty, recruiting duty, or duty with other services or with a major headquarters staff. As Marine Corps officers advance in rank and experience, they find themselves receiving advanced professional training at various service schools, attending graduate schools, and assuming greater responsibilities in command and staff positions.

It is at once a satisfying and demanding life. The officers in the Navy or Marine Corps present many faces to the world as they advance in seniority: professional sailor, Marine, aviator, engineer, manager, scientist, administrator, educator, diplomat, Fleet commander. This is not just a job, but a way of life—a career dedicated to the service of the United States and its people, carrying with it high professional prestige and opportunities for broad experience, a career which rewards the industrious, the loyal, and the imagina-



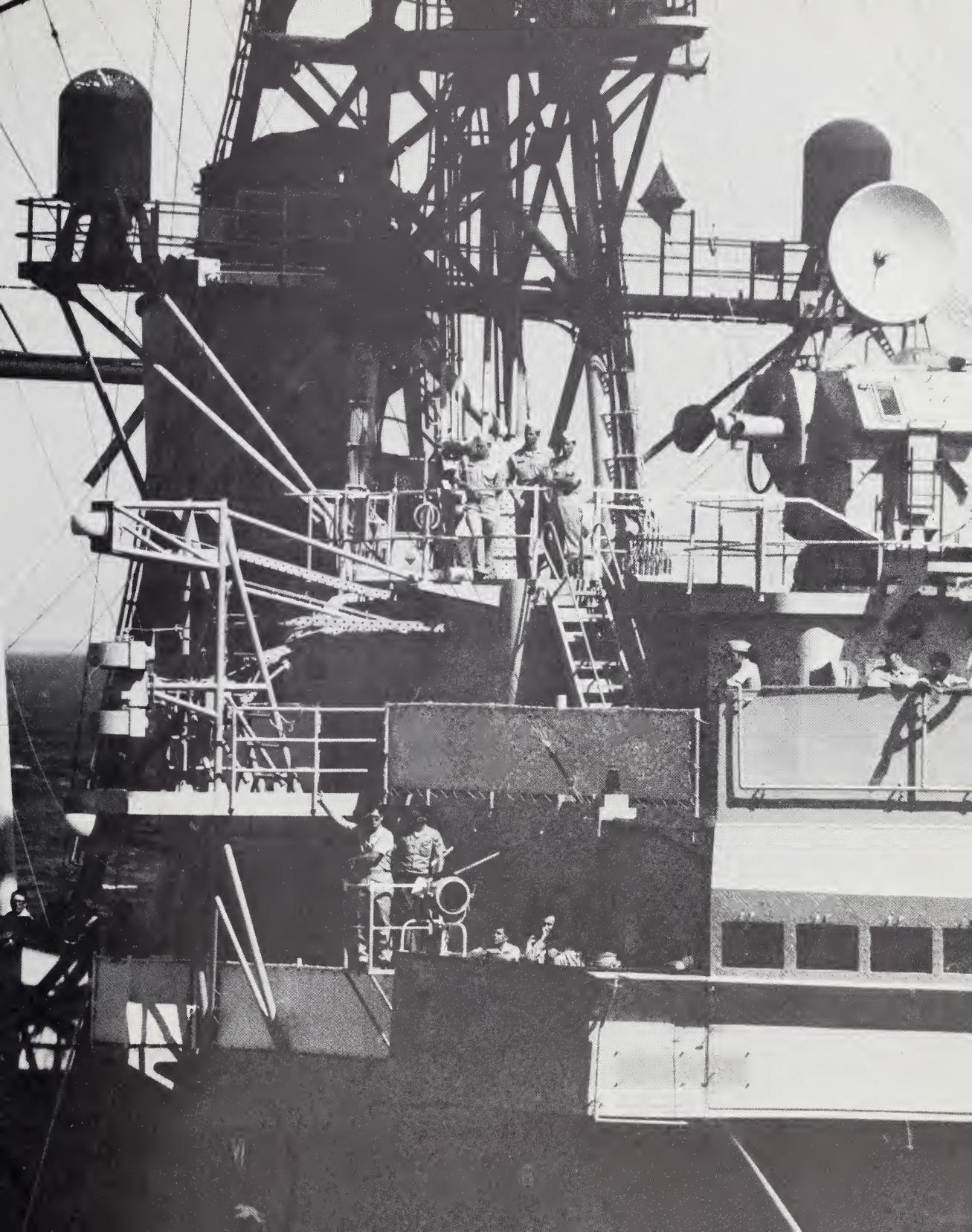
*"An officer is much more respected than any other man who has so little money."*

SAMUEL JOHNSON

*Courage disdains fame and wins it.*

ROYAL CORTISSOZ







*"Everyone gets into his own little depression thinking about what the guys are doing in other colleges back home. Then, while walking through the yard the next day, something seems to say, 'Hey, you're a lucky guy to be here' and everything seems to work out."*

tive. It is a career for those with a zeal for strenuous living, patriotism, and dedication to an ideal of real meaning, a meaning which can be translated into a lifetime of adventure and service in the Navy or Marine Corps of the United States.

## Officer Education and Training

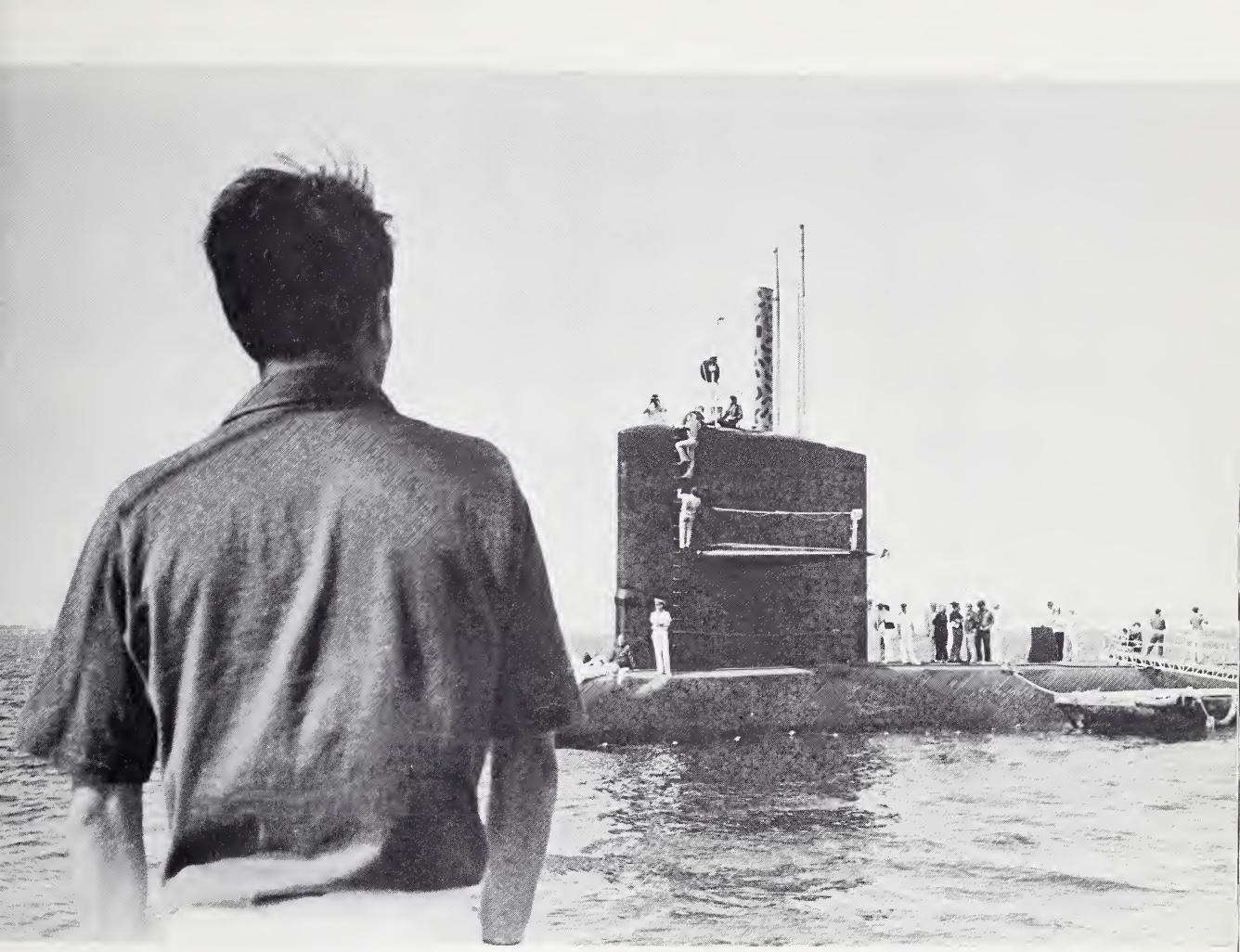
Upon graduation and commissioning, new officers may lay their books aside momentarily, but their theoretical and practical education will continue as long as they are in the service. From graduation day forward, they will continue to prepare for assignments of greater responsibility and professional attainment by acquiring practical experience ashore and afloat and through advanced academic work. The extent of attainment is limited only by ability, initiative, energy, and resourcefulness, commensurate with logical career planning and execution.

The Naval Academy is considered but the first step on the educational ladder, and so the Navy and Marine Corps sponsor a wide variety of graduate programs at both naval and civilian institutions, designed to prepare officers for higher responsibilities. This move toward graduate education begins before graduation for those midshipmen selected for scholarships in civilian universities or for Navy and Marine Corps-sponsored graduate programs.

Navy functional and technical courses provide the initial post-commissioning training for many officers. The duration and complexity of these courses vary widely but all are taught on a postgraduate level. They vary from the eighteen months of flight training for pilots to two- and three-week functional schools in damage control, communications, electronics maintenance, and antisubmarine warfare. Some exceptional educational opportunities are afforded by these curriculums. For example, the nuclear power training program, sponsored jointly by the Navy and the Energy Research and Development Administration, and to which many graduates go, is considered the finest technical preparation in its field anywhere in the world.

After the first tour (two to four years) of operational duty with the Fleet, some qualified Naval Academy graduates may expect orders to graduate study for one or more years. Opportunities for graduate work continue throughout an officer's career. Military war colleges, in particular, are noted for their high quality education in the fields of management, economics and international relations while relating these academic subjects to our global strategy. Officers who aspire to positions of high responsibility must, of necessity, continue to grow intellectually and thus be students during all of their professional lives.

The ever-increasing importance of our Navy in defense of this country and fulfillment of our national policy commitments has opened the way for



an unprecedented number of career opportunities for Navy and Marine Corps officers. Fleet and field operational experience continues to be an important constant in the career pattern, and the need for specialists trained in technical fields, governmental affairs, education, training, or managerial skills expands at a rate that can be satisfied only by a commitment of the Navy to the concept of an educated officer. This commitment has been made and reaffirmed at every level of leadership in the Department of the Navy. A career officer becomes a part of this commitment, and thus every Naval Academy graduate can be assured that his or her professional talents and intellectual ability will be enhanced by educational opportunities and by assignments that fully challenge interests and capabilities.

*"It's Tommy this, an' Tommy that, and Chuck him out, the brute! But it's Savior of 'is country when the guns begin to shoot."*

RUDYARD KIPLING



# V

## Admissions

Each year, the Naval Academy selects approximately 1,350 candidates for admission to the plebe (freshman) class. They come from every state in the union and from backgrounds reflecting every facet of American life. The Naval Academy encourages this diversity and recognizes the value and promise of a Brigade enriched by a membership representing every race, creed, color, and background found in this nation. Students from minority groups are strongly encouraged to apply for admission. The number of minority students in recent entering classes has risen sharply. The Class of 1981 included 176 (13 percent of the class) from racial and ethnic minorities.

Certain general eligibility requirements for candidates do exist. Candidates must be at least 17 years of age, and must not have passed their 22nd birthday by 1 July in the year of admission. They must be unmarried and have no children and, except for limited quotas of foreign midshipmen specifically authorized by Congress, must be citizens of the United States.

Meeting these requirements, prospective candidates must then proceed to obtain a nomination; qualify scholastically, medically, and in physical aptitude; and be selected for entry. The Admissions Board examines each candidate's school records, SAT or ACT scores, recommendations from school officials, extracurricular activities, and other evidence of character, leadership potential, and academic aptitude and achievement. Qualification for admission and competition for selection is based on consideration of all of the above factors.

### High School Program

Candidates should pursue studies in high school that will prepare them for a rigorous college program. The *quality* of the work is important. About three out of four candidates accepted for admission to Annapolis come from the top 20 percent of their high school classes, and chances for admission are very



*"You feel like you've really accomplished something. This is the first time in my life that I've spent a year worthwhile."*



*"This place has prestige. Americans admire someone who graduates from the Naval Academy. And I've got a foundation that will last me the rest of my life. I can build from this point because I made my mark here mentally, not just athletically."*

limited for those who stand below the top 40 percent. While the Academy does not have rigid requirements concerning the subjects which must be included in the school record, candidates are strongly urged to include the following subjects in their high school or prep school curriculum:

**Mathematics**—4 years, including trigonometry, **English**—4 years, **Modern Language**—2 years, **Chemistry**—1 year, **Physics**—1 year.

A small percentage of each plebe class will have had at least one semester of college work prior to admission to Annapolis. All such students must enter the Academy as plebes. The Admissions Board requires that applicants furnish transcripts of any college work they have taken.

### Precandidate Questionnaire

Applicants should submit a Precandidate Questionnaire to the Naval Academy in the spring of their *junior year*, or as soon thereafter as practicable. The Academy will open a preadmission file upon receipt of the questionnaire. Information gathered in this file will be used by the Academy to provide the applicant's Congressman with periodic status reports, including a preliminary evaluation of the applicant, results of the medical examination, and other information which may assist the applicant in being selected for a Congressional nomination. Precandidate Questionnaires should be requested from the Director of Candidate Guidance, U. S. Naval Academy, Annapolis, Maryland 21402.

### Candidate Guidance

The Candidate Guidance Office in Leahy Hall at the Naval Academy provides counsel to young men and women who are interested in a career of naval service through Annapolis. This office also coordinates the nationwide activities of some 1,700 selected Naval Reserve officers, not on active duty, and civilians who have been designated Naval Academy Information ("Blue and Gold") Officers. These officers are qualified to counsel applicants on all aspects of admission and are in close contact throughout the year with officials at Annapolis. Appendix E lists the State/Area Coordinators of this program. After reading this catalog, applicants who have questions about the Academy or its admission procedures should write to the coordinator nearest them or to:

Superintendent  
U. S. Naval Academy  
(Attn: Candidate Guidance)  
Annapolis, Maryland 21402

Candidates living on the West Coast may write

West Coast Regional Candidate Guidance Office  
NAS Moffett Field, California 94035

The Naval Academy is open to visitors from 8 a.m. to 5 p.m., Monday through Saturday, and from noon to 5 p.m. on Sunday. Prospective candidates are invited to drop by the Academy's Candidate Guidance Office in Leahy Hall to talk with a counselor from 8 a.m. to 5 p.m. Monday through Friday, and from 9 a.m. to noon on Saturday. No appointment is necessary.

## Tests

Either the College Entrance Examination Board (CEEB) Scholastic Aptitude Test (SAT) or the American College Testing Program (ACT) test is required of each candidate. These tests may be taken at any time they are offered, but not later than February of the year of admission to Annapolis. Candidates taking a test more than once will be credited with the highest score(s) achieved. Candidates interested in advanced placement (validation) are encouraged to take the appropriate College Board Achievement test(s), including the English Composition Test with essay. Since achievement tests are not considered in determining scholastic qualification for admission, they may be taken as late as May, except for the English Composition Test with essay, which is offered in December *only*.



*"A leader is a man who has the ability to get other people to do what they don't want to do, and like it."*

HARRY S. TRUMAN

## Test Dates for Candidates for the Class of 1983

|            | CEEB |                                                    | ACT         |      |
|------------|------|----------------------------------------------------|-------------|------|
| March 11   | 1978 | (SAT & Achievement tests)                          | April 1     | 1978 |
| May 6      | 1978 | (SAT & Achievement tests)                          | June 17     | 1978 |
| June 3     | 1978 | (SAT & Achievement tests)                          | October 21  | 1978 |
| October 14 | 1978 | (SAT in Calif., Texas, Florida, and New York only) | December 9  | 1978 |
| November 4 | 1978 | (SAT & Achievement tests)                          | February 10 | 1979 |
| December 2 | 1978 | (SAT & Achievement tests)                          |             |      |
| January 27 | 1979 | (SAT & Achievement tests)                          |             |      |

Arrangements to take the SAT or ACT tests can be made through a high school guidance counselor or by writing directly to the College Entrance Examination Board, Box 592, Princeton, New Jersey 08540; or Box 1025, Berkeley, California 94701; or to the Registration Department, American College Testing Program, P. O. Box 414, Iowa City, Iowa 52240.



*"The ideal condition would be, I admit, that men should be right by instinct; but since we are all likely to go astray, the reasonable thing is to learn from those who teach."*

SOPHOCLES

To assist them in evaluating and selecting their candidates, *some* Congressmen and other authorized nominators use competitive examinations of the U. S. Civil Service Commission. Although these special competitive examinations may be used as a tool to assist in the nomination process, they do not determine a candidate's scholastic qualifications for admission to the Academy. The Naval Academy requirements for the SAT or ACT tests must still be met.

## Obtaining a Nomination

Applicants *must* obtain a nomination to be considered for an appointment as a midshipman. It is advisable to apply for nomination *during the spring* of one's junior year in high school, because many members of Congress evaluate candidates during the summer months and some nominate in early fall. Most candidates will be notified of their nomination by the end of January during their senior year. There are many sources of nominations. Applicants should apply to *all* sources for which they are eligible, which always include their U.S. representative, both U.S. senators, and, for the especially well-qualified, the Vice President. The following is a listing of all nomination sources:

**U. S. Senators, Representatives, the Delegate to the Congress from the District of Columbia, and the Resident Commissioner of Puerto Rico.** Each may have five midshipmen attending the Academy at any one time. Ten nominations may be made for each vacancy. It is *not* necessary to know the official personally. Candidates should apply directly to their two senators and to the representative from their Congressional district. See appendix A for a sample letter of application.

**The President.** The President may appoint 100 midshipmen each year. These competitive appointments are limited by law to children of career officers and enlisted personnel of the Armed Forces, including Coast Guard, who are either on active duty (other than for training) and who have served continuously on active duty for at least the past eight years, or who are retired with pay or have died while retired with pay (other than those retired under Section 1331 of Title 10, USC—retirement at age 60 for combined active and inactive service of at least 20 years). Application should be made by 15 December to the Superintendent, U. S. Naval Academy (Attn: Candidate Guidance Office), Annapolis, Maryland 21402. See appendix A for a sample letter of application.

**The Vice President.** Nominating from the United States at large, the Vice President may have five midshipmen attending the Academy at any one time.

He nominates ten for each vacancy. Application should be made by 1 November to the Office of the Vice President, Washington, D. C. 20501.

**Delegates in Congress from Guam and the Virgin Islands.** Residents should apply to the appropriate official.

**Governors of Puerto Rico, the Canal Zone, and American Samoa.** Residents should apply to the appropriate official.

**Regular Navy and Marine Corps.** Completion of one year of active duty is required by 1 July of the year of admission. Eighty-five appointments are authorized each year. Application should be made via the applicant's commanding officer.

**Naval and Marine Corps Reserve.** The applicant must be on active duty or a member of a drilling unit, and have served in the reserve for one year prior to 1 July of the year of admission. There are 85 appointments each year. Application should be made to the applicant's commanding officer.

**Naval Reserve Officers' Training Corps (NROTC & NJROTC/MCJROTC).** There are ten appointments each year. Application should be made to the applicant's professor of naval science or senior naval science/military instructor.

**Honor Naval and Military Schools.** Three nominations may be made annually by the headmaster of each approved honor preparatory school to compete for ten appointments.

**Children of Deceased or Disabled Veterans and Children of Prisoners of War or Servicemen Missing in Action.** Children of armed forces members who were killed in action, or who died from wounds, injuries, or disease received while on active duty; or who sustained 100 percent disability (as certified by the Veteran's Administration) from such wounds, injuries, or disease; and children of servicemen who are currently prisoners of war or missing in action, are eligible. In addition, the children of civilians who are currently in a POW or MIA status are also eligible. A maximum of 65 appointees may be at the Academy at any one time. Applicants should write to the Superintendent, U. S. Naval Academy (Attn: Candidate Guidance Office), Annapolis, Maryland 21402.

**Children of Medal of Honor Winners.** Applications should be made to the Superintendent, U. S. Naval Academy (Attn: Candidate Guidance Office), Annapolis, Maryland 21402.

*Sample letters for requesting nominations appear in appendix A. Foreign students should refer to appendix C.*



*"I personally came here when a guy from here came to my school, and he was black, and he had graduated from my school. I thought that was really cool. He's the guy that actually talked me into coming here."*



*"The novelty of being a girl is not the hardest part of being here. Just being a plebe is the toughest."*

## Congressional Nominating Procedures

For each vacancy a member of Congress has at the Academy, the member may nominate ten candidates. They may be designated as "principal," "1st alternate," "2nd alternate," and so on to "9th alternate"; they may be nominated as a principal and nine competitive alternates for evaluation by the Naval Academy; or they may simply be nominated as a slate of ten competitors to be evaluated and ranked by the Naval Academy for the vacancy. The top person on the list who is accepted for admission by the Academy will be appointed. But this does not mean that the others are no longer considered. In fact, if *particularly* well qualified, it is possible that they all may be accepted for admission as qualified alternates or competitors.

## Admission of Qualified Alternates and Competitors

Each year the Naval Academy admits several hundred qualified alternates and qualified competitors to bring the entering class to the desired number. Thus, candidates nominated by a member of Congress, but not appointed to fill his vacancy, are still considered on a competitive basis for Annapolis, if qualified. No special application is necessary, as *all* qualified candidates will be considered automatically by the Academy's Admissions Board.

## Admission of Women

In meeting the "needs of the Service," it is estimated that the Naval Academy will be authorized by the Navy to admit approximately 90 women in the Class of 1983. The number of women who may be appointed from each of the existing sources of nomination listed on pages 60 and 61 of this catalog, will be proportional to the total number of appointments authorized by law for these sources. Women will compete with men nominated from the same sources, except for children of Medal of Honor winners who are admitted without limit if qualified.

Women who hold principal Congressional nominations will be admitted, if qualified, unless the number of women in line to receive an appointment from Congressional-type sources of appointment exceeds the number apportioned to these sources (the Vice President; U. S. Senators and Representatives; Governors of Puerto Rico, Canal Zone, American Samoa; Delegates from D. C., Guam, and the Virgin Islands; and the Resident Commissioner of Puerto Rico). If this occurs, women who are qualified principal candidates will compete in order of merit with women who are in line to be offered Congressional-type appointments, up to the number apportioned to these sources. The

remainder of the women in this group will have priority on a waiting list called the qualified alternates and competitors list.

Sound complicated? Yes, but if you read it again slowly you will see that, as Congress intended, women are being offered the maximum opportunity to compete with men up to the authorized number of appointments.

## Previous Candidates

Unsuccessful applicants for a previous entering class may reopen their admissions files for a subsequent class by writing the Director of Candidate Guidance. A second Prospective Candidate Questionnaire is not required. Applicants must, however, obtain a new nomination to be considered for admission, and they must continue to meet general eligibility requirements regarding age, marital status, etc. Retaking of SAT/ACT tests is highly recommended. Additionally, for maximum benefit, any college or junior college work taken between candidacies should include a curriculum similar to that of first-year midshipmen (i.e., a full academic schedule including math, science, and English).

## Readmission of Former Midshipmen

To be eligible for readmission, a candidate must *not* be past the 26th birthday on 1 July of the expected year of graduation. In addition to obtaining a new nomination and completing the other normal admission requirements, approval of the Naval Academy's Academic Board is required for readmission of former midshipmen. Requests should be addressed to the Dean of Admissions not later than 1 April.

## Medical Examination

Applicants must pass a very thorough medical examination designed to ensure that they possess the physical and mental fitness and the personality and behavior characteristics necessary for adjustment to service life and to carry out the rigorous demands of the Naval Academy program. Physically fit applicants in good health and who have normal vision usually have little difficulty in passing the examination. Candidates should carefully review the detailed medical standards contained in appendix B. Candidates having less than 20/20 uncorrected vision and/or having defective color vision should take careful note of the Eyes and Vision section, appendix B. Those who wear contact lenses must comply with special examination procedures.



*"The Naval Academy made me a successful man not only for football but for life. And to develop yourself as a man is the most important thing for everyone."*

ROGER STAUBACH



*"Man is the only animal that blushes  
—or needs to."*

MARK TWAIN

All medical examinations of candidates are conducted at designated Department of Defense medical examining centers. Examinations will be conducted only for those candidates who have been officially scheduled by the Department of Defense Medical Examination Review Board (DODMERB), a tri-service agency responsible for scheduling and evaluating examinations for all the U. S. service academies. The priority of medical scheduling of candidates is determined by the Naval Academy. This procedure is necessary because of the limited number and capacity of examining facilities available throughout the nation and the current shortage of military physicians.

For some candidates, this means that they will not be scheduled for a medical examination until they are otherwise qualified and in line to be considered for an appointment. Other candidates may not be scheduled at all if, for example, they are found not scholastically qualified by the Admissions Board. However, candidates may be assured that if they are otherwise fully qualified and are in a position to be appointed to the Naval Academy we will take immediate action to schedule their medical examination.

## The Physical Aptitude Examination

Candidates must score acceptably on the Physical Aptitude Examination to qualify for entry. Testing coordination, strength, speed, agility, and endurance, the aptitude examination consists of four tests: pull-ups (men) and flexed arm hang (women), and (men and women) a standing long jump, a kneeling basketball throw, and a 300-yard shuttle run. The examination is a separate examination, separately conducted, and is not part of the Medical Examination.

Complete details of this examination are provided candidates by the Naval Academy, along with a testing form and instructions for conducting the examination. It may be conducted by any teacher holding a degree in physical education or by any commissioned officer.

In addition to being in good physical condition in order to do well on this test, candidates are *strongly* advised to be in the best possible physical condition when they enter the Naval Academy in early July. The first summer is *very* demanding physically, starting with the very first day, and endurance and upper body strength are particularly important. Cross-country runs, weightlifting, isometric exercises, swimming, push-ups, and chin-ups, and (for women) the flexed-arm hang are valuable conditioning exercise prior to entry.



*"Be in good physical condition. Know what you are getting into. Don't expect everyone to like you. Realize that you always have to prove yourself. Be ready to sacrifice; it is not all meant to be fun."*

## Notification of Qualification and Selection for Appointment

All candidates are notified of their qualification status by 15 April. Offers of appointment are made on a continuing basis from 15 October to 1 May. Fully qualified candidates who have not been offered an appointment by 1 May will, in all probability, not be selected. All candidates *who have been offered an appointment* to the Naval Academy with the entering class will have the opportunity to visit the Academy in late May for a full day of orientation briefings and tours. The new class is admitted in early July.

## Profile of an Entering Class

In a typical year, we'll receive some 12,000 applications. Over 7,000 of these will receive official nominations and some 2,000 of these nominees will be found qualified scholastically and medically, and in physical aptitude by our Admissions Board. We'll offer appointments as midshipmen to about 1,650 of these, of which some 1,300 will accept and become members of our entering class. College Boards of the entering class, will *average* about 570 (English) and 660 (math); ACT will average 23 (English) and 31 (math); over 1,000 will have ranked in the top 20 percent of their high school class, and very few will have been below the top 40 percent; perhaps 100 will have had at least



*"Self-discipline is that which, next to virtue, truly and essentially raises one man above another."*

JOSEPH ADDISON

a semester of college; 60 will be children of alumni, and the class will include some 90 women and perhaps 170 minority midshipmen, of which some 60 will be black, 60 will be Oriental-American, and 50 will have a Hispanic background. Honors and activities will include: class or student body officers (18 percent); National Honor Society (52 percent); varsity letter winners (71 percent); dramatics, public speaking and debating (57 percent); leaders of musical group (8 percent); Eagle Scouts (10 percent); Boys/Girls State or Nation (14 percent); and ROTC, NROTC, AFROTC (8 percent).

## Pay and Expenses

Midshipmen are paid \$345.00 per month, commencing on the date of admission. This salary permits them to pay their own expenses; i.e., for uniforms, books, equipment, laundry, income tax, and spending money while at the Naval Academy. By graduation, midshipmen will have accrued savings averaging some \$1,800. Typically, this will be used to augment their wardrobe of officer uniforms and to help them establish themselves at their new duty stations.

Before being admitted as a midshipman, each candidate must deposit with the midshipmen's storekeeper the sum of \$300, to be used in partial payment for uniforms, clothing, etc. In cases of extreme hardship this sum may be reduced to \$100, in which case money allowances will be reduced until the individual's account reaches prescribed levels. The amount deposited is not refunded, but is expended at entrance for clothing, uniforms, etc., which become the property of the midshipman.

The regulation entrance outfit, plus the additional uniforms, clothing, textbooks, and expenses required the first year, are valued at approximately \$2,000. The deposit made at the time of entrance is supplemented by an entrance credit of \$1,200 upon first admission to the Naval Academy. The \$1,200 credit is an interest-free loan advanced by the government to defray the cost of the uniforms and equipment required during the first year. Repayment of the indebtedness is accomplished by monthly deductions of \$100 from the midshipman's pay, beginning in April of the first year at the Naval Academy and continuing until the indebtedness is liquidated.

## Service Obligation

Candidates entering the Naval Academy from civilian life, who have not previously acquired a military obligation, will automatically do so upon acceptance of appointment as midshipmen at the U. S. Naval Academy. Under Section 651 of Title 10, U. S. Code, any person who is enlisted, inducted,

or appointed in any of the armed services or their reserve components automatically acquires a six-year military obligation. Section V.A.1. of Department of Defense Directive 1332.23 of 9 May 1968 includes appointees to the service academies among those who are subject to the six-year obligation. Of this six-year obligation, Naval Academy graduates must serve five years on active duty as commissioned officers.

Enlisted members of the armed forces who accept appointments as midshipmen at the Naval Academy will not be discharged from their enlistment contracts or from their period of obligated service while they are in the status of midshipmen, except for physical disability or because of the acceptance of a commission. (Act of 25 June 1956, 1-2, re-enacted 10 U. S. Code 516.) Midshipmen in this category who are separated from the Naval Academy—except for one of the two reasons given above—will have their appointments as midshipmen terminated and will immediately resume their enlisted status. Members so reverted will be required to serve out their enlistments or obligated service, unless sooner discharged. In computing the unexpired portion of an enlistment contract or period of obligated service, the time served as a midshipman shall be counted as time served under such contract or period of obligated service.

### Agreement Signed by Entering Midshipmen

Upon admission, all midshipmen who are citizens of the United States will be required to sign an agreement, with the consent of their parents or guardian if a minor, that they will fulfill these obligations:

They will complete the Academy course of instruction (unless disenrolled from the Academy by competent authority).

They will accept appointments and serve as commissioned officers on active duty in the U. S. Navy or U. S. Marine Corps for at least five years immediately after graduation.

If authorized to resign from the Regular Navy before the sixth anniversary of graduation, will serve as commissioned officers in the Naval Reserve until the sixth anniversary.

### Resignations and Separations

Fourth and third classmen (freshmen and sophomores): A resignation tendered by a fourth or third classman (or a resignation tendered by a second classman prior to the beginning of the second class academic year) will be accepted when found to be in the best interests of the service.

Second and first classmen: After the commencement of the second class



*"I just wanted to see my parents . . . almost complete isolation during that plebe summer . . . Parents Weekend is tremendous—you know, you just feel proud of yourself, what you've been through, and you want to show somebody."*



*"The restrictions are not much fun, but preparation for the future is what I'm thinking about. You have to keep your objectivity and look past the little stuff."*

academic year, a second or first classman who is separated prior to completing the course of instruction, except for physical disability, unfitness or unsuitability, will normally be transferred to the Naval Reserve in an enlisted status and be ordered to active duty for not less than two years under the provisions of Title 10, U. S. Code 6959b. Where separation occurs as a result of deficiencies that are not considered willful, the active duty provision may be waived by the government.

Midshipmen who are separated after having entered the Naval Academy from the regular or reserve component of any service will revert to their former status under the appropriate statutory provisions. Completion or partial completion of a prior service obligation by separated midshipmen does not necessarily exempt them from transfer to a reserve component and call to active duty in accordance with Title 10, U. S. Code 6959b.

**Refusal to accept commission:** Any first classman who completes the course of instruction and declines to accept an appointment as a commissioned officer will be transferred to the reserve component in an appropriate enlisted status and ordered to active duty for four years.

Officers of the armed services serve at the pleasure of the President. No terminal dates are established for their commissions.

### Pre-Annapolis Scholarship Assistance

The U. S. Naval Academy Foundation, Inc., is a tax-exempt, nonprofit organization which provides an educational assistance program to enable deserving high school graduates to enhance their qualifications for admission to the Naval Academy. The Foundation is chartered for educational purposes under the laws of the State of Maryland. The Foundation's program is authorized and approved by the National Collegiate Athletic Association, and its aims are fully supported by the Superintendent of the Naval Academy.

The Foundation provides a limited number of post-high school preparatory scholarships annually to young men and women seeking admission to the Naval Academy to prepare for a career in the Navy or Marine Corps. Cash grants for these scholarships are made to participating junior colleges and preparatory schools or to a college selected by the applicant. Parents of young men and women selected for this program are expected to contribute financially within their capabilities. The Foundation offers no assistance other than counseling to individual applicants in obtaining nominations.

Application should be made to the Executive Director, U. S. Naval Academy Foundation, Inc., 48 Maryland Avenue, Annapolis, Maryland 21401. Applications should be received by 1 April each year, although a limited number of later applications can be considered.

## Naval Academy Preparatory School

The Naval Academy Preparatory School, located in Newport, Rhode Island, has prepared servicemen for entry into the Naval Academy for over half a century. Enlisted men and women study at the school from August to May. The class is usually about half from the Regular Navy and half from the Naval Reserve.

The Preparatory School offers college preparatory work in mathematics, physics, chemistry, and English. Students with appropriate backgrounds and abilities are able to undertake more advanced work, including courses at the college freshman level. Military training, physical training, and intramural and varsity sports programs complete the school's program.

Applicants presently in a regular or reserve military status should apply through their commanding officers in accordance with current service directives. Students are selected competitively based on a review of their records, including academic transcripts, the recommendations of their commanding officers, and their scores on the Navy General Classification tests.

Additionally, each year, the Naval Academy selects a number of the most promising and highly motivated of those civilian nominees who were not successful in being selected for admission to the Naval Academy. Those selected are offered the opportunity to enlist in the Naval Reserve for the express purpose of attending the Preparatory School. Details concerning this program are available from the Director of Candidate Guidance, U.S. Naval Academy, Annapolis, Md. 21402.



*"Esprit de corps thrives not only on success, but on hardships and adversity shared with courage and fortitude."*

ORLANDO WARD



## Questions and Answers

Over the years it has been our experience that a great many misconceptions exist concerning admission procedures, methods of obtaining nominations, qualification and selection for admission, and other basic information about the Naval Academy. The following questions are among those most often asked by prospective candidates. The answers may help you to clear up any doubts or misunderstandings you may have.

**Q. Who can become a midshipman?**

**A.** Admission is open to young men and women of good moral character, without regard to race, creed or national origin. Candidates must be citizens of the United States, unmarried and have no children, and be at least 17 years of age but not past their 22nd birthday on 1 July of the year of admission.

**Q. What must I do to become a midshipman?**

**A.** Obtain a nomination, qualify scholastically [acceptable entrance examination scores—either American College Testing Program (ACT) tests or College Entrance Examination Board Scholastic Aptitude Test (SAT); acceptable secondary school record, including college-preparatory work; top 40 percent of class], and meet prescribed medical and physical standards. Be selected for an appointment.

**Q. Where may I get detailed admissions information?**

**A.** Information may be obtained from the Naval Academy Information Officer in your area, from high school guidance counselors, from your local Navy recruiter, from the West Coast Regional Candidate Guidance Office, NAS Moffett Field, California 94035, or by writing or visiting the Candidate Guidance Office, Leahy Hall, U. S. Naval Academy, Annapolis, Maryland 21402.

**Q. What service selections are available to women?**

**A.** At present, Title 10, U. S. Code, Section 6015 states: "Women may not be assigned to duty in aircraft that are engaged in combat missions nor may they be assigned to duty on vessels of the navy other than hospital ships or



*"It takes the Navy  
three years to build a  
ship. It would take three  
hundred to rebuild a  
tradition."*

SIR ANDREW BROWN  
CUNNINGHAM

transports." This constraint means that, at present, women midshipmen could expect assignment to administrative shore billets in the Navy or Marine Corps, and that no more than a few could expect to be selected for the limited number of non-combat aviation billets available upon graduation. It should be emphasized that *all* physically qualified women will be commissioned in the line upon graduation from the Naval Academy. Thus, there will be no options for women to be commissioned in the Supply Corps, Civil Engineering Corps, etc., unless they are not physically qualified for a line commission.

**Q. I don't know my Congressman. How do I get a nomination?**

**A.** It is *not* necessary to know him personally. Apply to the representative of your Congressional district and to both of your U.S. senators by mail; your applications will be considered carefully. (See Precandidate Questionnaire, pg 58.) Each member of Congress may have five of his appointees attending the Academy at any one time. And each member may nominate up to *ten* candidates for each vacancy. The essential thing to remember is that, by law, you *must* have a nomination to be considered for appointment. Once you are nominated, you officially become a candidate and your record can then be evaluated by the Naval Academy on its merits. Even if you are not selected to fill a Congressman's vacancy, if you have one of his nominations and have a good school record and otherwise meet the basic entry standards, you will have an excellent chance to become a midshipman. Each year several hundred of the best qualified alternate Congressional nominees are appointed to the Naval Academy by the Secretary of the Navy to bring the entering class up to authorized strength.

**Q. I'm in the Naval Reserve. Can I get into the Academy?**

**A.** Up to 85 enlisted reservists (Navy and Marine Corps), on active duty or members of drilling units, may qualify to enter the Academy each year through the Reserves. See your commanding officer for details.



*"My visit to the Academy was an extremely helpful experience."*



*"To find out what one is fitted to do and to secure an opportunity to do it is the key to happiness."*

JOHN DEWEY

**Q.** *If I am eligible for a Presidential nomination, should I also apply for a Congressional nomination?*

**A.** Yes. The more nominations you obtain, the better chance you will have for selection if you are found fully qualified.

**Q.** *Is it difficult to enter directly from high school?*

**A.** No. Over nine out of ten midshipmen enter directly from high school or prep school.

**Q.** *My grades were about average, but I played in several sports and was student body president. Also, I had to work after school. Will these activities help me?*

**A.** Yes. Evidence of leadership ability and participation in extracurricular activities, including athletics and part-time jobs, are considered in our evaluations.

**Q.** *Is physical preparation important?*

**A.** It certainly is. Aside from helping candidates to do well on the physical aptitude test, men and women alike should be as physically fit at entrance *as possible*, since the first summer is *very* demanding. Endurance and upper-body strength are particularly important. Cross-country runs, swimming, push-ups and chin-ups, and (particularly for women) the flexed-arm hang are valuable conditioning exercises. Be in shape! Or be sorry.

**Q.** *I have a high IQ and am a straight-A student. Will most of my time be spent on military subjects, or may I take any electives, such as electrical engineering?*

**A.** From 23 to 38 percent (depending on the major selected) of the Academy's curriculum is devoted to professional military studies, but at the Academy you will complete at least 140 rather than the 120 semester hours typical of most civilian colleges. There are many academic majors offered, from English to mathematics to physics to electrical engineering. Advanced research projects are offered in these and many other areas.

**Q. What part of the medical examination gives the most difficulty to candidates?**

**A.** The eye examination. Visual acuity of 20/20 is required. However, a limited number of outstanding candidates may be granted waivers for visual acuity if the refractive error is not excessive and their vision is correctable to 20/20. If within waiverable limits, and otherwise fully qualified for admission, you will be considered *automatically*, based on your overall record, for a waiver by the Academy's Admissions Board. Since only a limited number of nominees may be granted a medical waiver, the competition for the available waivers is keen. It should be noted that *all* nominees within waiverable limits (and otherwise fully qualified), including principal nominees of Congressmen, must compete for these waivers.

**Q. I don't like sports. Do I have to try out for anything?**

**A.** If you really dislike sports, then the Naval Academy may not be the best school for you. A midshipman is required to participate in athletics, either varsity or intramural, for the development of character, physical fitness, and competitive spirit.

**Q. How much does it cost to be a midshipman?**

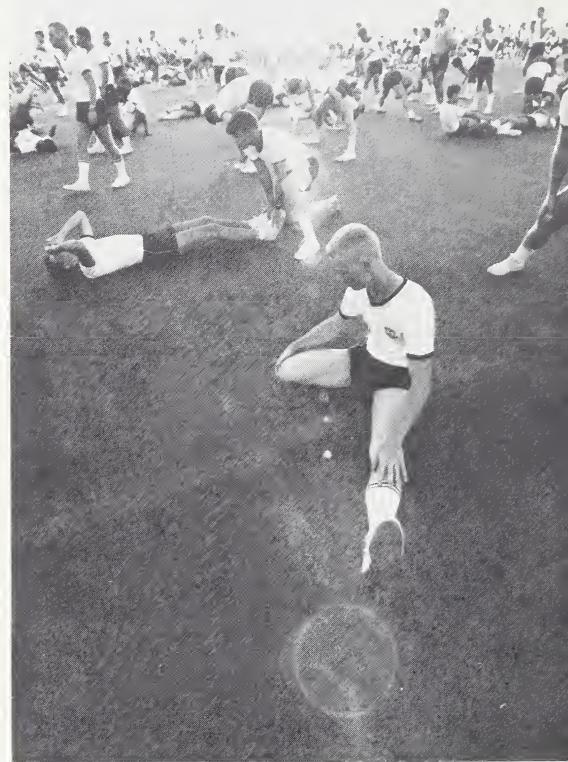
**A.** Tuition, room and board, and medical and dental care are provided. In addition, midshipmen receive a monthly salary of \$345.00 for uniforms, books, and personal needs. Salary and the value of the daily ration allowance (\$2.92/day) accrue to a midshipman's pay account while on leave. A \$300.00 deposit is required on entry.

**Q. How often may I visit home?**

**A.** During Christmas and spring leaves. In addition, month-long summer leaves are granted to the three upper classes. You must pay for your own travel.

**Q. How many flunk out?**

**A.** About ten percent of each entering class eventually leaves the Naval Academy because of academic failure.



*"When I first got here, I thought it was going to be hard as hell. I was right, but now that I've been here awhile, it's worth it."*



*"There never was a good war, or a bad peace."*

BENJAMIN FRANKLIN

**Q. Do I get to fly?**

**A.** All midshipmen receive flight indoctrination in naval aircraft during the third summer. After graduation, selected volunteers receive flight training leading to designation as aviators in the Navy or Marine Corps.

**Q. Do I get to choose any of my courses?**

**A.** Yes, you will choose your major and the majority of your courses. The great majority of midshipmen get their first choice of a major. Occasionally, however, in order to better meet the future needs of the Navy, midshipmen must accept their second choice. The Navy expects that at least 80 percent of our midshipmen will pursue engineering or science-oriented majors.

**Q. How much social life would I have at the Academy?**

**A.** Social life is *very* limited during the first year. After the initial (plebe) year, there is a wide range of social activities available. There are weekend dances and other extra-curricular activities at the Academy, and there are opportunities for afternoon liberties in town and for a number of weekends away from the Academy.

**Q. I am a high school freshman. When should I start preparing myself for the Academy?**

**A.** Now! Your entire four-year high school record in academics and your record in athletics and other extracurricular activities for your last three years will be evaluated by the Naval Academy.

**Q. I am in college. Is it too late to enter the Academy?**

**A.** No. As long as you will not have passed your 22nd birthday on 1 July of the year of admission. Prior college work will permit study of advanced courses at the Academy. Normally, about five to eight percent of the members of an entering class have been enrolled in a civilian college.

**Q. If I failed to be selected for an appointment for one class, am I eligible to apply again?**

**A.** Yes, as long as you still meet basic eligibility requirements pertaining to age, citizenship, etc., and obtain a new nomination (see Previous Candidates, pg 63). Also, each year, a number of the most promising of our unsuccessful candidates is invited by the Academy to enlist in the Naval Reserve for the express purpose of attending the Naval Academy Prep School. Here, they become eligible to compete under a Secretary of the Navy nomination.

**Q.** *When should I apply for a nomination?*

**A.** Apply to the representative from your Congressional district and to both your senators for a nomination, whenever possible, in the spring of your *junior* year in high school. Although a few apply as late as December of the senior year, this is not advised since most members of Congress will have selected their nominees by this time.

**Q.** *What is my military obligation on graduation?*

**A.** Six years. Current directives require five of these to be on active duty as a commissioned officer in the Navy or Marine Corps.

**Q.** *Can I become a Navy physician or dentist?*

**A.** There *was* a limited program for pre-medical training at the Naval Academy a few years ago, but it does not exist for present entering classes. If your primary interest is to become a Navy doctor or dentist, it is recommended that you attend a civilian college offering premedical studies.

**Q.** *Does the Naval Academy have a pre-law major?*

**A.** The Academy has no pre-law program and you might better plan to attend a civilian college offering pre-law studies if your primary interest is to become a Navy lawyer. Naval Academy graduates may apply for the Navy's law education program after two years of commissioned service. This is a very limited program, however, with only 25 officers selected from the entire Navy and Marine Corps each year. Officers not selected are required to continue their careers as line officers.



*"...expect a deep satisfaction in meeting the challenge that not all the resentment or hard times can take away."*



*"Academics are a lot rougher than I expected. If all I had to worry about was my studies, it probably wouldn't be so bad..."*

**Q.** *My father was in the armed forces. Will this help me to get a nomination?*

**A.** Sons and daughters of career members of the regular and reserve forces who are on active duty or retired may be considered for a nomination under the Presidential category.

**Q.** *What if a midshipman is found to be smoking marijuana or to be using other unauthorized drugs?*

**A.** The Naval Academy considers a midshipman's possession or use of unauthorized drugs, including marijuana, to be a most serious offense for which the normal disposition is dismissal.

**Q.** *Where do midshipmen live?*

**A.** They are housed in one building, Bancroft Hall, perhaps the largest dormitory in the world. Bancroft Hall has more than 4.8 miles of corridors and 33 acres of floor space. Each room has its own shower and all rooms have been remodeled in recent years. The Midshipmen's Wardroom is also located in Bancroft Hall. Here all 4,300 midshipmen are able to sit down and eat at one time. The food is served family style. The Hall contains a store, medical and dental facilities, a soda fountain, bowling alleys, and numerous other facilities.

**Q.** *I have nominations to both the Naval and the Air Force Academies. Must I undergo two medical examinations?*

**A.** No. A single Qualifying Medical Examination conducted at any of the military examining centers designated by the Department of Defense Medical Examination Review Board is acceptable for all service academies.

**Q.** *What reasons are given most frequently by plebes who resign from the Academy?*

**A.** Resigning plebes most frequently say:

(1) They came to the Academy under parental pressure. After a few weeks as plebes, they feel that they have fulfilled their obligation to their parents and can resign.

(2) They were attracted to the Academy by its glamour. They knew that the academic program was demanding, but they failed to realize the extent of the daily demands made on their time by the military and professional aspects of the training at Annapolis. Some, apparently, were expecting more of a relaxed, college-type NROTC program than the regimen of a service academy.

**Q.** *As a male graduate, what are my career choices on graduation?*

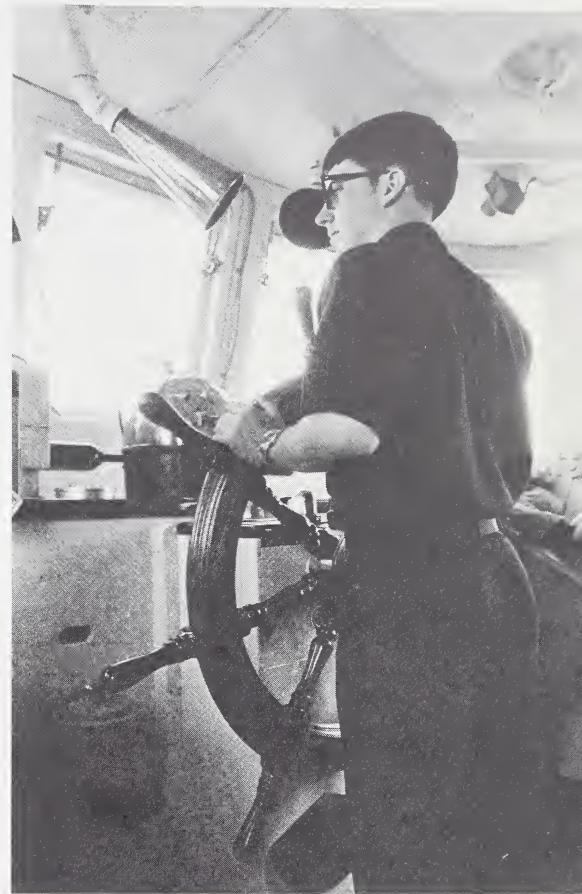
**A.** During the first semester of the senior year, midshipmen found medically qualified for commissioning as line officers choose from the following service selections on graduation: (1) the surface warfare community, (2) the submarine service, (3) naval aviation, or (4) the U. S. Marine Corps (either ground or pilot/aviation officer training). Additionally, up to five highly qualified graduates may be selected for the Navy Engineering Duty officer specialty. Those not medically qualified for line duties are commissioned in the staff corps or the restricted line. (Women: See Assignments for Women Officers, page 49.)

**Q.** *How do I apply and what are my chances of getting into the Naval Academy Preparatory School?*

**A.** No application is necessary from *civilian* candidates. You will be considered automatically, based on your record, in the event you are unsuccessful in gaining an appointment to the Naval Academy. There are also ways (see current Service directives) for servicemen and women, regular and reserve, to apply for direct entry into the Prep School. Competition for the Preparatory School is quite intense, although it is somewhat less competitive for candidates applying for admission from the Fleet.

**Q.** *Is there a Naval Academy representative in my home town?*

**A.** There are more than 1,600 Naval Academy representatives located throughout the country. See appendix E for the state coordinator nearest you.



*"On my first day as a plebe I called my father and told him 'I'm leaving here.' On the way back from the phone booth I changed my mind and never looked back."*

ADMIRAL ELMO R. ZUMWALT



8  
SOIL MECHANICS  
LAB



## The Curriculum Challenge

Young men and women entering the Naval Academy can be confident that the professional education and training at Annapolis will give them the knowledge and skills they will need to perform their future military duties effectively. The development of professional officers has been central to the objectives of the Naval Academy since its founding over 130 years ago. It is today. But today's Naval Academy offers considerably more. The Naval Academy is primarily an academic institution, offering in-depth studies in engineering, science and the humanities. The curriculum is demanding, and its many choices are designed to challenge each midshipman in terms of his own academic aptitudes and interests.

The day is long past when every line officer could be expected to embody all the qualifications and specialties desired or needed in a naval career. Today's Naval Academy, therefore, does not seek to give the same all-inclusive educational package to every graduate. Rather, it undertakes to produce in every graduating class a group of individual line officers—all thoroughly educated at the baccalaureate level and well trained in basic professional subjects.

Each midshipman must satisfy certain minimum course requirements in mathematics and science and in the social sciences and the humanities. Midshipmen must also complete a major sequence from a variety of fields designed to provide them with the academic background necessary for effective leadership in today's Navy or Marine Corps. Consistent with the Navy's technical orientation is the Academy's minimum requirement of having 80 percent of the midshipmen major in one of the engineering, math or science disciplines. The remaining midshipmen may major in one of the humanities or social sciences.

The Navy has an ever-increasing need for officers educated in the engineering disciplines and thus offers extensive opportunities to its officers for graduate work and career specialties or subspecialties in engineering programs.



*"I'm really not that smart. I have to work at it. I don't fool around in class. I listen to the professor and I know how to study."*



Seven engineering majors offered by the Naval Academy lead to designated degrees which are accredited by the Engineering Council for Professional Development.

## Choosing a Major

A midshipman's choice of a major governs the number of related and supporting courses required in science, engineering, mathematics, or foreign languages. Majors in the scientific-technical fields entail more courses, at higher levels, in mathematics, science, and engineering, for example, than do non-technical majors. The scientific-technical programs require no foreign language. On the other hand, programs in social sciences, international studies, and English do require foreign language study, yet these programs also include four semesters of mathematics, one year of chemistry, and a year of physics.

Some plebes are sure of their study preferences and their academic aptitudes when they first arrive at the Academy. However, midshipmen are normally not ready to make a firm selection of their major at the beginning of plebe year. They may have a general idea of the area of interest, without being sure of which major they should take. They may not yet know whether their talents lie in a technical or nontechnical field. And, during plebe year, they may very well discover that their real interests and abilities do not fit the requirements of the major fields first considered.

For these reasons, selection of a major\* is delayed until near the end of the Common Plebe Year when the midshipman has had nearly two semesters of meaningful academic experience in fundamental courses which test ability and help to evaluate strengths and weaknesses. Approval by the Academic Dean of each midshipman's choice of a major will depend upon the needs of the Navy and the educational background of the midshipman.

## The Common Plebe Year

During the first year at the Naval Academy each midshipman is placed in a program of study at a level suited to ability and academic background. These courses are broad enough in scope to provide a sound basis for the selection of a major during the latter part of the year. At the same time they contain an element of commonality which enables the midshipman to progress into any of the majors offered. They include the naval science courses which start professional development. The normal academic load for a plebe consists of six courses each semester as follows:

\* The majors described in this catalog (chapter 7) are subject to changes to meet the needs of the Navy and, therefore, should not be considered as a contract between the candidate and the U. S. Naval Academy.

## The Common Plebe Year

| First Semester |                                           |       | Second Semester |                                            |       |
|----------------|-------------------------------------------|-------|-----------------|--------------------------------------------|-------|
| NS101          | Fundamentals of Naval Science             | 2-2-3 | NL102           | Leadership I                               | 2-0-2 |
| HH103          | Modern Western Civilization               | 3-0-3 | HH104           | American Naval Heritage                    | 3-0-3 |
| HE111*         | Rhetoric and Introduction to Literature I | 3-0-3 | HE112*          | Rhetoric and Introduction to Literature II | 3-0-3 |
| **             | Calculus I                                | 4-0-4 | **              | Calculus II                                | 4-0-4 |
| **             | Chemistry                                 | 3-2-4 | **              | Chemistry                                  | 3-2-4 |
| SI100          | Introduction to Computing                 | 2-0-2 | EN100           | Introduction to Naval Engineering          | 2-0-2 |

17-4-19\*\*\*

17-2-18

\* Students selected by the English Department take HE101 Practical Writing the first semester, HE111 the second semester, and HE112 during their third class (second) year.

\*\* Offered at several levels, depending on the background and academic ability of the midshipman. In the case of Calculus I, the lowest level is a pre-calculus course, SM005, for midshipmen whose academic background has not adequately prepared them for calculus. It does not count as part of the minimum mathematics requirement.

\*\*\* 17 hours of classroom recitations per week; 4 hours of laboratory work per week; 19 total semester hours credit.

**Fundamentals of Naval Science (first semester) and Introduction to Naval Engineering (second semester).** These courses provide midshipmen with knowledge and skills for practical shipboard use during youngster cruise, the most important event of third-class summer. They also serve as preparation for the professional courses and training which come during the next three years.

**History.** The plebe history program is a two-semester sequence. Western civilization since 1715 is surveyed during the first semester, focusing upon topical areas such as geography, social, political, and cultural developments as well as the evolution of military institutions and policies. During the second semester, America's naval heritage is explored and students examine the antecedents, origins, and development of the United States Navy within the framework of America's growth as a continental and, eventually, global power.

**Mathematics.** A year of calculus provides the requisite mathematical foundation for further study in the various majors. Midshipmen are placed in a sequence appropriate to their backgrounds and ability.

**Writing, Rhetoric, and Literature.** Designed to develop primary tools for further education and professional development. Includes intensive practice in a variety of writing techniques, critical thinking and reading.



*"Without knowing the force of words, it is impossible to know men."*

CONFUCIUS



*“... high school preparation was poor and my study habits left a lot to be desired . . . took a whole semester to learn how to study. Chemistry and calculus are the hardest.”*

**Chemistry.** A year of study is required in this basic discipline. Midshipmen are placed in course sequences of varying difficulty depending upon their ability and background.

**Computer Science.** Each midshipman is introduced to the use of the computer during plebe year. Computers are becoming increasingly important in virtually every aspect of the modern Navy, and midshipmen are expected to use them as tools in a number of their Naval Academy courses.

**Leadership.** An introductory course to instill in midshipmen a professional sense of purpose and personal honor, those military leadership traits and techniques which will insure credibility in the communication of their ideas and commands, and an appreciation for individual and organizational factors which influence their performance as leaders.

## Advanced Placement

Prior to entering the Naval Academy, many midshipmen take courses equivalent to those offered or required here. We consider one or more of the following in determining whether to grant credit for this work: validation examinations given by the appropriate academic departments, transcripts, and results of College Entrance Examination Board Achievement Tests and Advanced Placement Tests, if available. Validators of any of the plebe courses may be enrolled in more advanced courses during plebe year, if they desire, or they may elect to carry a lighter academic load. About one-half of the members of a plebe class validate at least one course.

## Counseling and Guidance

Midshipmen are responsible not only for deciding upon their major, but also for selecting specific courses and planning their semester schedules. They may thus set, within certain limits, the pace of studies to match their capabilities. An average student, for example, will likely take sequential courses as they are laid out for normal progress in a given major program. If ready for advanced placement in some subjects, or able to handle more than the standard number of courses, the midshipman may complete the requirements more rapidly and gain time for more elective courses. Some midshipmen may even complete second majors.

Although decisions regarding their academic program must be their own, midshipmen have ample opportunities for consultation with faculty members. During the first few weeks at the Naval Academy, they receive about 20 hours of group and individual counseling on all aspects of the curriculum.

They also take a number of achievement tests to help determine the levels at which studies should begin.

Temporary academic advisers are assigned to the fourth class midshipmen until a major is chosen, normally in the spring of plebe year. Following selection of a major, a faculty member from the department in which the student has expressed a particular interest will be assigned as the midshipman's permanent faculty adviser to help define study objectives and offer guidance toward a logical selection of courses. In addition, the faculty adviser concerns himself with the midshipman's over-all academic progress and any academic problems encountered from plebe year through graduation.

## Nuclear Propulsion Training Program

Midshipmen have the opportunity to apply in the fall of their senior year for training in nuclear propulsion following graduation. Candidates selected undertake six months study in Nuclear Power School, Orlando, Fla., followed by six months training at one of three nuclear reactor prototype sites in Idaho, New York, or Connecticut. Completion of the year's training leads to assignment in a nuclear powered surface ship or submarine, the choice being the individual's. Midshipmen who aspire to duty in one of these exciting ships can acquire a strong foundation by majoring in engineering, science, or mathematics. Judicious choice of elective courses in the scientific/technical area and energetic application to the entire academic program improve the humanities major's chances for selection into the program. Each midshipman selected for nuclear propulsion training, regardless of the major, takes one of several mathematics, science, or engineering courses the second semester of the senior year to enhance preparation for Nuclear Power School (shown as NPP in the professional requirements listed with each major in the following chapter).



*"I guess I've always planned on doing what I did . . . wrote a thesis at the Naval Academy on the liquid-fueled rocket, and that was before NASA ever got going."*

ASTRONAUT JAMES LOVELL

## Professional Course Requirements

A series of professional courses is required for the Bachelor of Science degree. In addition to providing the professional background required of officers during their first few years in the Fleet or the Marine Corps, these courses contribute to more effective summer training with the Fleet while they are midshipmen. Because the professional courses required subsequent to plebe year vary slightly, depending on the majors program being followed, these requirements are specified with descriptions of the various majors beginning on page 91.





## Distribution Requirements

To assure a broad general education and to provide a sound background for further study in selected majors, midshipmen must satisfy certain distribution requirements in the humanities, social sciences, mathematics, science, and a modern language. These requirements are specified for each major (chapter 7).

## Academic Organization

The major areas under the direction of the Academic Dean are organized into four divisions—the Divisions of Engineering and Weapons, Mathematics and Science, U. S. and International Studies, and English and History—each headed by a Navy captain or Marine colonel. The divisions are further subdivided into departments, 15 in all, which serve as focal points for the

*"Three may keep a secret, if two of them are dead."*

BENJAMIN FRANKLIN



*"The reasonable man adapts himself to the world; the unreasonable man persists in trying to adapt the world to himself. Therefore all progress depends on the unreasonable man."*

GEORGE BERNARD SHAW

administration of the majors program and for the continuing review and development of the curriculum. The departments are chaired by civilian or military members of the faculty.

A fifth major academic area, the Division of Professional Development, is under the cognizance of the Commandant of Midshipmen.

## The Nimitz Library

The Nimitz Library, completed in 1973, provides midshipmen and faculty with comprehensive library service in support of the curriculum, research, and recreational reading. A representative book collection is maintained in pertinent fields of knowledge, and the library is especially strong in naval science and history. In addition, the excellent resources of the libraries in the Washington and Baltimore areas are available to midshipmen and faculty members.

The library contains some 480,000 volumes and accommodates between 1,400 and 1,500 readers, utilizing a seating combination of study tables, study carrels, and lounge furniture. Included in the building are seminar, faculty and group study rooms, typing and calculating rooms, audio and video carrels, and a computer terminal room.

The Naval Academy Archives, the Division of U. S. and International Studies, the Educational Resources Center, and the Naval Academy Photographic Laboratory are also located within the library building.

## Academic Computing Facilities

The Naval Academy has one of the most modern and extensive time-shared computer systems to be found at any college or university in America. Here, similar to a library, the computer is recognized as an essential educational resource for broad usage by midshipmen. Over two hundred remote computer terminals are located throughout the Academy in areas convenient to midshipmen and faculty. They are accessible from 8 a. m. until midnight seven days a week. A wide variety of useful computer languages is offered such as BASIC, FORTRAN, ALGOL, APL, and many others. Courses in virtually every academic department reflect the impact of the computer. An extensive public library of computer programs is available for instant use.

## The Educational Resources Center

The Educational Resources Center at the Naval Academy provides a broad range of services. It is responsible for production and distribution of closed

circuit TV programming over the Academy's 12-channel system. There is a lending library of educational films, an audio-visual equipment loan pool, and a graphic arts section. An audio-visual room, located in Nimitz Library, is maintained with videocassette programs for use by midshipmen as a remedial and tutorial tool.

## Special Programs

**Trident Scholars.** Under the Trident Scholar program, initiated in 1963, a limited number of exceptionally capable midshipmen may carry out independent research and study during their senior year. Each scholar has a reduced formal course load, since the research and thesis constitute the main part of the academic program for the year. Scholars are assisted in their projects by one or more faculty advisers who are well acquainted with the field of study.

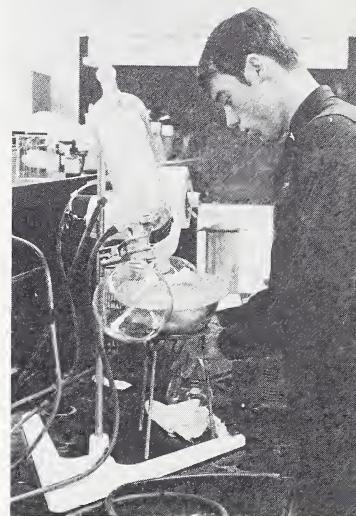
**The Postgraduate Preparatory Study Program.** The purpose of the Academy's postgraduate preparatory study program is to provide the fleet with better trained officers, to prepare graduates for advanced study, and to reduce the time required for attainment of an advanced degree. Under the program, qualified first class midshipmen will be encouraged to undertake advanced courses, which in many cases will be acceptable for graduate credit. These courses are above and beyond those required for the baccalaureate degree at the Naval Academy.

## Grading

The Naval Academy employs the letter grades, A, B, C, D, and F (A denoting excellence; F, failing), which are in turn assigned a numerical Quality Point Equivalent (QPE) of 4.0, 3.0, 2.0, 1.0 and 0.0 respectively.

Grades are averaged, using a weighted semester-hour system called a Quality Point Rating (QPR). The QPR is computed by multiplying the QPE corresponding to the letter grade received in each course by the semester hours of credit for the course, then dividing the sum of these products by the total number of semester hours represented by all the courses taken. A semester QPR (SQPR) is computed only for courses taken during a given semester; a Cumulative QPR (CQPR) is based upon all academic marks assigned to date.

An academic probation system provides warning for midshipmen who are not making satisfactory progress toward graduation. If a midshipman's



*"I came here because I am serious about the business of learning."*



*"Going to the Academy is something I have always wanted to do. It is definitely not a cop-out for blacks to go to Annapolis. America is my country and I want to get with it."*

cumulative QPR is below 2.0 at the completion of a semester, he or she is placed on academic probation for the following semester. A midshipman is also placed on probation for the semester following any two consecutive semesters in which the semester QPR is below 2.0, even though the cumulative QPR remains above 2.0.

It should be noted that grades received in military performance, conduct, and physical education, and for certain professional training conducted during the summer, are not included in the computation of QPR. Satisfactory performance is required, however, and these grades are assigned very significant weight in determining class standing.

As required by law, the Academic Board examines the records of all academically deficient midshipmen for the purpose of deciding which of them should be retained. A midshipman is subject to academic discharge who has failed two or more courses, has a Semester QPR below 1.5, has failed to remove academic probation, is two or more courses behind in the matrix of the assigned major, has failed to fulfill a requirement previously assigned by the Academic Board, or has failed to fulfill all graduation requirements at the end of first class year.

On the other end of the grading scale, two honor categories are available to midshipmen. The Superintendent's List honors midshipmen attaining a SQPR of at least 3.4 with no grade below C, and with grades of A in military performance and in conduct and B or better in physical education. Called "star midshipmen," they proudly wear gold stars on the lapels of their uniforms. The Dean's List honors midshipmen with a minimum SQPR of 3.4 with no failure ("F") in any academic course or other area, including professional studies, aptitude, conduct, and physical education.

## Graduation Requirements

To qualify for graduation a midshipman must:

- (1) Complete the courses specified for the assigned major;
- (2) Complete 140 credit hours, of which a minimum of 18 credit hours, exclusive of the required English courses, will be in the humanities and social sciences.
- (3) Achieve a cumulative quality point ratio (CQPR) of at least 2.00, a "C" average;
- (4) Meet required military-professional standards in professional studies and at-sea training;
- (5) Meet required standards of military performance, conduct, honor, and physical education;
- (6) Accept a commission in the U.S. Navy or U. S. Marine Corps if proffered.

All midshipmen who graduate are awarded the Bachelor of Science degree by the Superintendent upon the recommendation of the Commandant and the Academic Dean, as approved by the Academic Board.

## Residence

The curriculum at the Naval Academy is of four years' duration, as required by law. This means that students who validate courses or who can carry extra courses have the opportunity to do additional advanced work, pursue independent study and research, complete the requirements of two majors, or study other subjects for self-improvement or of general interest.

## Schedule of Instruction

The calendar year is divided into two semesters and a summer term. The academic year consists of two semesters, each of approximately 16 weeks of instruction and one week of examinations. The normal academic routine provides for five and one-half days of classroom, laboratory, and study periods per week. Small classes, averaging 20 midshipmen, provide ample opportunity for active classroom participation by each midshipman and for individual attention.

## Academic Emphasis

The emphasis and diversity of the Naval Academy's academic program can best be summarized as follow:

Seven designated Bachelor of Science degrees.

Bachelor of Science in Aerospace Engineering  
Bachelor of Science in Electrical Engineering  
Bachelor of Science in Mechanical Engineering  
Bachelor of Science in Systems Engineering  
Bachelor of Science in Marine Engineering  
Bachelor of Science in Naval Architecture  
Bachelor of Science in Ocean Engineering

One undesignated degree, Bachelor of Science, with majors in:

|                      |                     |                    |
|----------------------|---------------------|--------------------|
| Chemistry            | Physics             | *English           |
| Mathematics          | Physical Science    | *History           |
| Resources Management | General Engineering | *Political Science |
| Oceanography         | *Economics          |                    |

\* No more than 20 percent (combined) of the class may enroll in these programs



*"Our colleges ought to have lit up in us a lasting relish for the better kind of man, a loss of appetite for mediocrities."*

WILLIAM JAMES



# VII

## The Academic Program

### Division of Engineering and Weapons

Department of Aerospace Engineering

Department of Electrical Engineering

Department of Mechanical Engineering

Department of Naval Systems Engineering

Department of Weapons and Systems Engineering

### Department of Aerospace Engineering

#### Aerospace Engineering Major

Aerospace Engineering, an ECPD accredited major, focuses on the study of compressible and incompressible fluid flows, conventional and advanced propulsion systems, vehicle performance, stability and control, and modern structural mechanics. It deals primarily with the analysis and design of air cushion vehicles, aircraft and spacecraft. Basic principles and sound engineering techniques are stressed.

The curriculum provides for various research projects and choice of a wide variety of electives. Throughout the program extensive use is made of laboratory facilities, which include a propulsion lab; a rotor lab; low speed, transonic, and hypersonic wind tunnels; and a structures lab. Field tests are also conducted using a flight test aircraft, small surface effects vehicles, and a variable stability flight simulator. Computer techniques are emphasized for data reduction, design, and graphic display.

A solid foundation is laid which permits postgraduate work in a number of fields. A Bachelor of Science in Aerospace Engineering is awarded.

#### Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NN203, NS252, NL200, ES300, NN302, NL303, NS300,\* NL400;

Mathematics: SM211, SM212 plus one elective;

\* Taken during second class summer



*"In no other profession are the penalties for employing untrained personnel so appalling or so irrevocable as in the military."*

GENERAL DOUGLAS MACARTHUR



*"I'll tell you this: I'm walking out of here with a super education. Free. No one can hold me down now."*

Science: SP211, SP212;  
Humanities/Social Sciences: HE300,\* FE 210 plus three electives;  
Language: none;  
Special: EN201, EM231, EM319, EM232, EE331, EE332, EM217, EM214, ES410;  
Major: EA201, EA212, EA313, EA323, EA331, EA417, EA433, EA440, EA413 plus two approved electives.

\* Taken during second class summer

\*\* Not offered every year.

### Aerospace Engineering Courses

**EA201 Introduction to Aerospace Engineering** (0-2-1). Gives a broad overview of aerospace engineering and presents those fundamental concepts upon which flight depends. Introduces a brief history of flight, a description of flight vehicles, and their principal parts. Aerospace environment is presented with emphasis on the earth's atmosphere. Concept of momentum is introduced and applied to give an understanding of the principles of thrust, lift, and drag; and the dynamics of fluid flow are discussed. Principles of flight propulsion and various types of propulsive devices are described.

**EA212 Aerodynamics I** (3-2-4). A study in perfect fluid theory encompassing the basic principles of aerodynamics and their application to specific problems. *Prereq: EA201, SM211.*

**EA313 Aerodynamics II** (3-0-3). A second course on aerodynamics, covering viscous flows and boundary layer theory, finite wing topics, conformal mapping, propeller theory, and applications to combined wings and bodies. *Prereq: EA212.*

**EA323 Aerospace Structures I** (2-2-3). Applications of statics, dynamics and solid mechanics to the design of flight vehicle structures. Topics include energy methods, generalized bending, elastic center, shear flow in semimonocoque structures, and indeterminate space trusses. Finite-element solution techniques are introduced. *Prereq: EM217.*

**EA331 Gasdynamics I** (2-2-3). A comprehensive coverage of the methods of gasdynamics in internal and external flow systems, including thermodynamics of perfect and real gases and fundamental theorems of one-dimensional compressible subsonic and supersonic flows. *Prereq: EM312 or EA313, EM324; SM212, EM311 or EM319.*

**EA410 Flight Performance II** (3-0-3). The basic principles of aerodynamics are extended to include flight vehicle analysis. Modern methods of finite wing analysis are introduced. The time-sharing computer is used to aid in the analysis of typical flight performance problems. *Prereq: EA210.*

**EA411 Orbital Mechanics** (3-0-3). A vector mechanical two-body treatment of ballistic missile and spacecraft trajectories. Included topics are: orbit determination, in-plane and out-of-plane orbit changes, position and velocity as a function of time, rendezvous, and vehicle accuracy as a func-

tion of launch errors. *Prereq: SM212, EM232 or EM216.*

**EA413 Stability and Control** (2-2-3). The aerodynamic and inertial forces and moments acting on the flight vehicle and its component parts are analyzed to determine their effect on static and dynamic stability. *Prereq: EA210 or EA212.*

**EA415 Elements of Flight Test Engineering** (2-2-3). A flight laboratory course designed to provide practical application of theoretical principles learned in prior courses dealing with flight performance, aerodynamics, and stability and control. In-flight laboratories are conducted in the departmental aircraft. *Prereq: EA210 or EA212.*

**EA417 Flight Performance** (3-0-3). The basic principles of aerodynamics are extended to include flight vehicle analysis. Modern methods of finite wing analysis are introduced. The time-sharing computer is used to aid in the analysis of typical flight performance problems. *Prereq: EA313.*

**EA421 Aerospace Structures II** (3-0-3). Numerical, matrix and empirical methods of wing and fuselage structural analysis. Use of digital computer for problem solving. Instability analyses of columns, beam-columns, plates and shells including tubing, metal and semi-diagonal tension field beams. *Prereq: EA323, SM212.*

**EA422\*\* Aeroelasticity** (3-0-3). Analysis of the coupling of aerodynamic forces on lifting surfaces to structural response associated with flexible aircraft. Topics covered include fundamentals of vibrations of structural systems, deformations and motions of aircraft structure, wing divergence, control effectiveness and reversal of aileron, flutter of wings, and aeroelastic testing. *Prereq: EA311 or EM324, EA323 or EM423 or EN356 or EN441.*

**EA431 Gasdynamics II** (3-0-3). Non-steady compressible flow analysis including influence coefficients, viscous and thermal effects, detonation and deflagration, shock tube theory, pressure exchange and combustion, dynamic flow machines, and thrust generators. *Prereq: EA331.*

**EA433 Flight Propulsion** (2-2-3). The principles of fluid dynamics and thermodynamics are specialized to the problem of propulsion of aircraft and space vehicles. *Prereq: EM311 or EM319, EM318 or EA311.*

**EA435 The Aerodynamics of V/STOL Aircraft** (3-0-3). An advanced course covering the aerodynamics of vertical and short take-off and landing aircraft, including fixed wing and rotary wing types, with major emphasis on the helicopter. *Prereq: Approval of instructor and department chairman.*

**EA440 Aerospace Vehicle Design** (1-4-3). Preliminary design of a flight vehicle. Includes preliminary layout, weight and balance estimates, performance analysis, stability analysis, and structural analysis. Detailed consideration will be given to one aspect of the design. *Prereq: EA323, EA433.*

**EA450\*\* Computer-Aided Design in Engineering** (2-2-3). Introduction to the engineering design process as well as its computer adaptation. Capabilities and utilization of various computer types,

such as digital computers, analog computers, and CRT computer graphics, are discussed. *Prereq: 2/C or 1/C standing, engineering or science major; SI102.*

**EX437 Principles of Surface Effect Vehicles** (3-0-3). The governing parameters of air suspension; types, and principles of cushioncraft and surface effect vehicles; dynamics of cushion vehicles, plenum chambers, peripheral jets, and wings in ground effect. The external aerodynamics of surface effect vehicles, flight over land and water, drag, and wave interaction. The internal aerodynamics of duct flow, fan design and valving. Various propulsion schemes and structural designs. An actual two-man hovercraft is used to support the lectures. *Prereq: EM324 or EA311, EM311 or EM319 or permission of instructor.*



## Department of Electrical Engineering

### Electrical Engineering Major

Electrical Engineering, an ECPD accredited major, combines analysis techniques and experimentation to place primary emphasis on fundamental principles. The resulting basic background, supported by the analytical skills developed, equip the graduate for growth and contributions in the expanding and vital fields of electronics, communications, data acquisition, and data processing and display which permeate today's Navy. Outstanding research facilities support the program of study. A Bachelor of Science in Electrical Engineering is awarded.

#### Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NN203, NS252, NL200, ES300, NN302, NL303, NS300,\* NL400;

Mathematics: SM211, SM212, SM311;

Science: SP221, SP222, SP226, SP431;

Humanities/Social Sciences: HE300\* and four electives courses;

Language: none required;

Special: EM214, EE221, EE222, EE322, EM318, EM319, EN201, ES410;

Major: EE341, EE342, EE421; EE352, EE423; plus at least three of the following: EE431, EE432, EE451, EE452, EE461, EE462, EE471, EE472, ES409, ES414 (or ES415) SP436, SP321.

\* Taken during second class summer

\*\* Not offered every year.

*"Ours is a maritime nation, requiring the most powerful navies to protect our free rights to the farthest reaches of the seas."*

LYNDON B. JOHNSON

### Electrical Engineering Courses

**EE221 Introduction to Electrical Engineering** (3-2-4). Terminal characteristics of passive linear and nonlinear devices and energy sources are introduced. Network combinations of these devices are analyzed in the steady state. In addition to mesh and nodal analysis by computer techniques, concepts of equivalence and network theorems are studied in detail. *Prereq: SM112.*

**EE222 Circuit Analysis I** (3-2-4). This course treats topics in linear and nonlinear network analysis: time-invariant and time-varying resistance, inductance, and capacitance; impulse response and its convolution; state variables; negative-resistance oscillation and limit cycles; digital computer methods for solving and checking network equations. *Prereq: EE221.*



*"I personally feel that anybody who is picked to be a midshipman can make it through here if he wants to."*

**EE311 Electrical Fundamentals and Applications I** (3-2-4). Provides an understanding of the terminal characteristics of circuit building blocks including resistors, capacitors, inductors, diodes, and transistors. The basic techniques of circuit analysis using these building blocks to model real devices are presented. Basic principles of logic circuitry are also introduced at this time. *Prereq: SP202.*

**EE312 Electrical Fundamentals and Applications II** (3-2-4). A continuation of the application of modeling and analysis to practical electronic devices and machines. Covered are basic amplifiers, frequency response characteristics, and signal handling circuitry with emphasis on analog integrated circuits. The course finishes with the principles of operation and analysis techniques applied to transformers and rotating machines. *Prereq: EE311.*

**EE313 Electronic Systems** (3-2-4). Study of electronic analog and digital circuit characteristics with instrumentation applications in data acquisition, signal conditioning, waveshaping, and information display through use of integrated circuits. *Prereq: EE312.*

**EE322 Signals and Systems** (3-0-3). The principles of circuit analysis are extended to the transmission of signals through linear systems. The

approach is based on determination and interpretation of the natural frequencies, pole zero diagrams, and their relation to the state equations. Transform techniques are applied to the analysis of analog filters. The course closes with an introduction to similar techniques in the discrete sampled time domain and digital filters. *Prereq: EE222.*

**EE331 Electrical Engineering I** (3-2-4). A study of fundamental DC and AC electrical and electronic circuits. Circuit analysis includes natural and forced response of first and second order systems; the sinusoidal steady state is investigated in both time and frequency domains. Semiconductor theory is introduced and includes the study of applications of diodes and transistors in the areas of rectification, regulation, waveshaping, and digital logic. *Prereq: SP211; SM211.*

**EE332 Electrical Engineering II** (3-2-4). Continues student's survey of electrical engineering. In this second semester the emphasis is on the understanding, modelling and use as signal handling devices of amplifiers, both discrete and integrated circuits. The course ends with an in-depth look at the characteristics of transformers and rotating machines using previously learned techniques of analysis and modelling. *Prereq: EE331.*

**EE341 Electronics I** (3-2-4). Each major semiconductor device (p-n junction diode, bipolar and field effect transistors) is introduced by presenting a physical picture of its internal behavior. This approach leads naturally to device characterization in terms of appropriate external variables and allows small-signal and large-signal models to be constructed. Emphasis is on large-signal and digital applications of the devices, especially in integrated circuit form. Applications are emphasized in the weekly laboratory exercises. *Prereq: EE222.*

**EE342 Electronics II** (3-2-4). Small signal and analog applications in integrated circuit operational amplifier designs. Hybrid parameter and hybrid Pi models are used to predict voltage, current, and power gains, input and output impedances and frequency response of single stage and cascaded amplifiers. The feedback concept is discussed in detail and stability is treated quantitatively and the relationship between "amplifier" and "oscillator" is developed. The course concludes with power circuits and systems. *Prereq: EE341.*

**EE352 Communications Electronics** (3-0-3). Principles of small-signal and large-signal radio frequency amplifier and oscillator circuits employing discrete circuit elements. Basic principles of amplitude modulation and frequency modulation. Typical circuits for generating AM and FM signals and for demodulating such signals. Radio receivers and alignment techniques. R-F transmission lines and use of the Smith chart for rapid calculations. Directional characteristics of antennas and antenna arrays. Single-side-band transmitters and receivers. Pulse modulation. Principle of FM stereo broadcasting and reception. *Prereq: EE341 or EE332.*

**EE421 Energy Conversion** (3-2-4). Characteristics and construction of electromagnetic devices which configure power and control systems, including motors, generators, and transformers. Equivalent circuits are developed and used to predict performance under steady state and dynamic conditions. Laboratory time is spent to determine parameters of equivalent circuits and to compare actual performance with predicted. *Prereq: EE331.*

**EE423 Electrical Engineering Design** (2-2-3). Practice in engineering. Each midshipman chooses a project, and writes a report that describes in detail exactly what he intends to build. The instructor must approve the project and the midshipman builds, troubleshoots, and packages his circuit. The remainder of the term is devoted to gathering data on the performance of and writing a final report on his project. *Prereq: EE342.*

**EE424\*\* Electronic Instruments and Measurements** (2-4-4). Fundamentals of electronic measuring instruments with emphasis on digital instruments and on the use of mini/microcomputers in measurements. *Prereq: EE341.*

**EE431\*\* Communications Theory I** (3-0-3). Introduction to the concepts of communication processes. Time and frequency domain characteriza-

tion of signals and transmission of linear systems. Mathematical theory of information bearing signals, modulation and demodulation. *Prereq: SM311.*

**EE432 Communications Theory II** (3-2-4). Extension of the methods of signal analysis to random processes. Elements of detection theory and decision processes. Emphasis on correlation techniques and digital as well as analog processing. *Prereq: EE431.*

**EE451 Electronic Properties of Semiconductors** (3-0-3). Develops an understanding of those semiconductor parameters that relate directly to its performance in semiconductor devices. The hole and conduction electron and charge carrier distribution as a function of energy are developed. Charge carrier dynamics leading to drift, diffusion, generation and recombination are used to investigate transport phenomena. *Prereq: SP222.*

**EE452 Semiconductor Electronics** (3-2-4). An introduction to the physics and technology of planar silicon devices. The p-n junction is considered in detail and is followed by a treatment of junction transistors and junction field-effect transistors. Also surface effects and surface-controlled devices; theory of semiconductor surfaces, surface effects on p-n junctions and the MOS field-effect transistor are discussed. The laboratory entails a special project. *Prereq: EE451.*

**EE461 Waveshaping Techniques** (3-2-4). Design techniques for semiconductor switching circuits. Logic concepts and their use in the study of switching circuits and systems. The use of operational amplifiers for amplification, filtering, and waveshaping. Analysis of fundamental digital logic elements. Minimization and implementation of digital logic systems. *Prereq: EE342 or EE332.*

**EE462 Logic Design** (2-4-4). Design of combinational circuitry. Flip-flop structures and transition maps. Sequential circuit design. Organization of digital systems including timing and mode circuitry. Micro-computer architecture, design, and programming. *Prereq: EE461.*

**EE471 Microwave Systems** (3-2-4). Fundamental radar design concepts including application of the radar equation to CW, FM-CW, MTI, and pulse-doppler radar. Characteristics of microwave components such as power sources, amplifiers, filters, waveguides, and antennas. System performance analysis with emphasis on signal detection and information extraction in an environment corrupted by noise, clutter, and target scintillation. *Prereq: SP431.*

**EE478 Naval Sensors** (3-0-3). Theoretical principles of passive and active naval sensors operating within the frequency spectrum from audio to visible. Emphasis on conceptual fundamentals which bind together seemingly diverse sensor systems such as: sonar, navigation, radio, television, radar, ECM, ECCM, IFF, laser range finders, infrared imagers, and LLLTV. *Prereq: EE471 or SP436.*



*"Knowledge of the oceans is more than a matter of curiosity; our very survival may hinge on it."*

JOHN F. KENNEDY



# Department of Mechanical Engineering

## Mechanical Engineering Major

Mechanical Engineering, an ECPD accredited major, is the most diverse of the engineering curricula. A sound background in engineering fundamentals, science, and mathematics is provided, and the range of electives offers concentration in several specialized areas of engineering.

In addition to centralized classrooms, shops, analog and digital computing systems, and other interdisciplinary laboratories, the Department maintains such diverse facilities as a materials science laboratory complex, dynamics and physical systems laboratory, solid mechanics laboratory complex, and a thermodynamics and fluid dynamics laboratory. A Bachelor of Science in Mechanical Engineering is awarded.

### Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NN203, NS252, NL200, ES300, NN302, NL303, NS300,\* NL400;

Mathematics: SM201 or SM211 or SM251, SM212, SM311;

Science: SP211 and SP212;

Humanities/Social Sciences: HE300,\* FE 210 plus three electives;

Language: none;

Special: EM217, EM231, EM232, EM313, EM319, EM324, EE331, EE332, ES410;

Major: EN201, SM311, EM320, EM371, EM411, EM471, EM472 plus four approved electives.

\* Taken during second class summer

*"Under all circumstances, a decisive naval superiority is to be considered a fundamental principle, and the basis upon which all hope of success must ultimately depend."*

GEORGE WASHINGTON

## General Engineering Major

The General Engineering major provides the student with a basic technical education in mathematics, science, engineering fundamentals, and naval professional engineering subjects. It is intended to provide an adequate background for future naval technical training and education. Midshipmen completing the General Engineering major receive a non-designated Bachelor of Science degree. The major is not accredited by ECPD.

### Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NN203, NL200, EN200, NS252, NS300,\* NL303, NN302, EN300, ES300, EE311-312, ES400, NL400;

Mathematics: SM201 or SM211 or SM251 and SM212;

Science: SP201 or SP211, SP202 or SP212 or SP222;

Humanities/Social Sciences: HE300\* and four approved electives;

Language: none;

Special: Two approved engineering, mathematics, or science electives;

Major: EN201, EM214, EM217, EM231, EM232, EM327, EM328, EM371, EE313 plus two approved electives.

\* Taken during second class summer

\*\* Not offered every year.

## Mechanical Engineering Courses

**EM214 Elements of Materials Science (2-2-3).** An introductory course in the physical, electrical and mechanical properties of engineering materials in-

cluding their structures, use in engineering applications, environmental effects, and modes of failure.  
Prereq: 4/C Chemistry; Coreq: Calculus III.

**EM217 Strength of Materials (3-2-4).** A first course in mechanics of deformable bodies with emphasis on the engineering approach to the response of these bodies to various type loadings. Topics include stress-strain relationships, stress-strain analysis, load-deflection, bending, torsion, buckling, temperature effects, and dynamic response. *Prereq: EM231; Coreq: SM212.*

**EM221 Introduction to Statics (2-0-2).** An introductory course in the principles of static equilibrium. The systems studied consist of rigid bodies subjected to forces and moments. The use of the free-body diagram is stressed in the solution of problems. *Prereq: SP201 or equivalent.*

**EM222 Elements of Strength and Properties of Materials (3-2-4).** A first course in strength and properties of materials which includes concepts of stress and strain, mechanical properties of materials, torsion, bending and shear stress in beams, beam deflection, long columns, behavior of metals and alloys, phase diagrams, and heat treatment and hardenability of steel. *Prereq: EM221 or equivalent.*

**EM231 Statics (2-0-2).** An initial course in applied vector mechanics with emphasis on static equilibrium. Topics include forces, moments, couples, equivalent force-couple systems, centroids, distributed forces, and Coulomb friction. The application of the free body diagram in the analysis of static equilibrium of frames, machines and trusses is stressed. *Prereq: 4/C mathematics; Coreq: Calculus III and General Physics I.*

**EM232 Dynamics (3-0-3).** A course in classical vector dynamics. Topics include vector algebra and calculus, kinematics of particles and rigid bodies, as well as the use of Newton's and Euler's second laws, energy and momentum methods involving problems for particles and rigid bodies. *Prereq: EM231; Coreq: SM212.*

**EM313 Materials Science (3-2-4).** An introductory course in the physical and mechanical properties of engineering materials (including metals, ceramics, and plastics), their structures, use in engineering applications and failure phenomena. All laboratory projects are structured to provide strong physical illustrations for the topics covered in lectures. *Prereq: EM217.*

**EM318 Applied Fluid Mechanics (3-0-3).** A first course in incompressible fluid mechanics. Topics include properties of fluids, fluid statics, integral conservation equations, differential field analysis, dimensional analysis and similitude, incompressible boundary layers, viscous flow in conduits, and flow about immersed bodies. *Prereq: EM319 or equivalent.*

**EM319 Engineering Thermodynamics (3-0-3).** A basic thermodynamics course in which the first and second laws of thermodynamics are studied primarily from the classical macroscopic viewpoint and applied to both closed and open systems. Work-



ing substances include perfect gases, real gases and vapors in addition to solids and liquids. Naval applications are emphasized. *Coreq: SM212.*

**EM320 Applied Thermodynamics (2-2-3).** Laboratory equipment which operate on principles of thermodynamics and fluid mechanics is used to reinforce a study of gas and vapor power cycles, refrigeration and air conditioning, ship and aircraft propulsion systems, combustion, energy conversion, and compressible flow. *Prereq: EM319 or equivalent.*

**EM324 Fluid Dynamics (4-0-4).** An introductory course in fluid dynamics in which both the differential and integral approaches are used in describing the conservation laws of fluid flow. Applications of the resultant governing equations are made to hydrostatics and ideal and real fluid flows. *Prereq: EM319 or equivalent.*

**EM327 Essentials of Fluid Dynamics (3-0-3).** An introductory study of the behavior of fluids at rest and in motion. Effects of various fluid properties and forces on flow patterns, and force interaction between fluid and its boundaries are presented. *Prereq: SM212 or SM202.*

**EM328 Thermodynamics (3-0-3).** An introductory course in classical thermodynamics stressing the understanding and application of the basic laws of thermodynamics. A logical development of the relationships among physical properties of interest in the thermal sciences is also presented. *Prereq: SM212.*

*"Most of them (the profs) will tell you, 'Anything until 11 o'clock (at night); if it's important call me.' You know you'll get help if you are really hurting. They'll help you out."*



*"The best opportunity  
at Annapolis is to learn  
to work with people."*

**EM371 Introduction to Design** (2-2-3). Fundamentals of mechanical design, with emphasis on the design of pertinent machine elements. Topics such as fasteners, springs, anti-friction bearings, lubrication and journal bearings, gearing, and shafts are covered. *Prereq: EM217, SM212; Coreq: EM232.*

**EM411 Heat Transfer** (3-0-3). Study of thermal radiation, steady and transient conduction, laminar and turbulent convection, internal and external flow, boundary layers, and empirical correlations. Applications address fins, nuclear reactor cooling, heat exchangers, and interactive computing. *Prereq: EM319 and EM324.*

**EM423 Mechanical Vibrations** (3-0-3). The treatment of vibration fundamentals, including free, damped, and forced harmonic vibrations of linear single and multi-degree of freedom systems, transient and non-periodic vibrations, continuous systems, and random vibration analysis. *Prereq: Strength of Materials and SM311.*

**EM425 Process Dynamics** (2-2-3). Ship propulsion system elements such as pressure vessels and heat exchangers are described by mathematical models. Theoretical responses are compared with pilot plant outputs. Predictive power of the mathematical models is improved by parameter adjustment. *Prereq: SM212.*

**EM426 Process Control** (2-2-3). Mathematical models are developed for typical shipboard systems where thermodynamic variables such as temperature and pressure are controlled automatically. Theoretical responses are compared to outputs of pilot plant models of these same systems. *Prereq: SM212.*

**EM431 Experimental Stress Analysis** (2-2-3). Theoretical considerations of combined stresses are compared with experimental methods. Electrical resistance strain gage, photoelasticity, moiré, and brittle-coating techniques are studied in detail and extensively used in the laboratory. *Prereq: EM217.*

**EM432 Computer Methods in Structural Mechanics** (3-0-3). Structural design and analysis; matrix formulation employing flexibility and stiffness methods of analysis, computer languages, and techniques in structural design. Topics include temperature effects, effects of settlement of supports, and misfit of structural parts. *Prereq: EM217.*

**EM434 Advanced Mechanics of Materials** (3-0-3). Topics include theories of elasticity and plasticity, stress and strain as tensors, compatibility and constitutive relationships, energy methods, stability, yield functions, behavior of time dependent materials, plasticity limit theorems, plastic design. *Prereq: EM217 and SM311.*

**EM442 Computer Methods in Engineering** (3-0-3). A study of mathematics to support computer graphics, geometric transformations, and curve definition. Applying graphic techniques of design of cams, gears, and other mechanical components.

Programming techniques for storage and refresh CRT displays. *Prereq: 1/C or 2/C standing.*

**EM443 Energy Conversion** (3-0-3). Introduction to energy conversion and utilization. Terrestrial and thermodynamic limitations, direct energy conversion devices, alternative energy sources, present and future energy research and development, and energy usage and economy are presented. *Prereq: EM319 or equivalent.*

**EM444 Turbomachinery** (3-0-3). Fundamentals of fluid mechanics and thermodynamics are used to study the performance characteristics of radial and axial flow compressors, turbines, fans, and pumps. Supporting laboratory demonstrations cover three-dimensional effects and losses. *Prereq: EM319, EM324, or equivalent.*

**EM446 Environmental Systems Engineering** (3-0-3). Principles of thermodynamics, heat transfer, and fluid mechanics as applied to the creation and control of thermal environments. Cycles and equipment for heating, cooling and humidity control. Air transmission, distribution, and cleaning are also considered. *Prereq: EM319 or EM328.*

**EM453 Physical Metallurgy** (3-0-3). Study of the principles of physical metallurgy including imperfections in crystal structures, liquid and solid phases of metals, phase transformations, and solid-state reactions with applications to metallurgical processes such as casting and welding. *Prereq: EM313.*

**EM454 Mechanical Behavior of Materials** (3-0-3). Treatment of the mechanical properties and behavior of materials. Elastic, plastic, viscous, and viscoelastic behavior are treated, as well as modes of failure including brittle and ductile fracture. Rupture, stress corrosion cracking, creep, and fatigue are also considered. *Prereq: EM214 or EM313 and EM217.*

**EM462\*\* Hydrodynamics** (3-0-3). Analysis of two and three dimensional inviscid incompressible flow fields. General solutions to LaPlace's equation; superposition of flow fields; conformal transformations. Real fluid limitations. Experimental verifications and example applications. *Prereq: EM324.*

**EM471 Mechanical Engineering Experimentation** (1-4-3). Planning experiments and making measurements. Statistical inference plans; data analysis; detailed work on thermocouples and strain gages; pressure, flow, vibration and other measurements; and testing for signal validity. *Prereq: 1/C standing in Mechanical Engineering major or approval of department chairman.*

**EM472 Mechanical Design** (2-2-3). A detailed study of the engineering design process through lectures and case studies emphasizing design phases, engineering economics, and program management. Practical experience is gained by participation in team projects. *Prereq: EM371, or approval of department chairman.*

# Department of Naval Systems Engineering

## Marine Engineering Major

This ECPD accredited major is concerned with the analysis and design of propulsion power plant systems. It is nuclear engineering oriented. Students completing this program can expect to continue their education in the Navy's Nuclear Power Program or in nuclear or marine engineering graduate studies.

A broad background in engineering fundamentals is provided students, who then apply these principles in their studies of conventional steam and nuclear power plants, gas turbines, and such advanced power systems as fuel cells and thermoelectric units.

A course covering the principles of naval engineering systems develops an understanding of the principles of ship design and construction and introduces students to the problems of analyzing and designing systems for use in the ocean environment. Studies in modern physics prepare them for the reactor physics and reactor engineering courses. Studies in heat transfer—so essential in the study of modern propulsion power systems—follow. Knowledge gained from these studies is then used in the analysis of marine propulsion plants and in group designs of future propulsion systems.

Past designs by students have included the concept design of a propulsion plant for a low water plane catamaran, preliminary design of a submarine waste disposal system, and the concept design of an offshore nuclear power plant. A Bachelor of Science in Marine Engineering is awarded.

### Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NN203, NS252, NL200, ES300, NN302, NL303, NS300,\* NL400;

Mathematics: SM211, SM212;

Science: SP211, SP212;

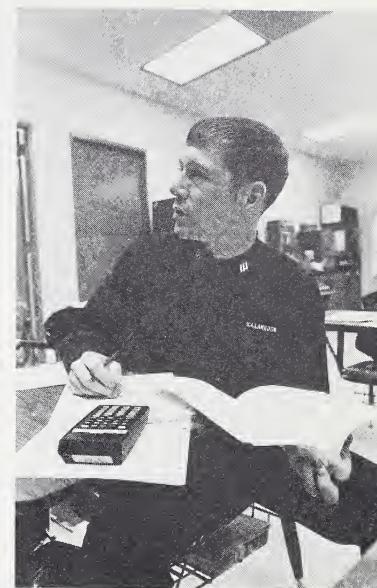
Humanities/Social Sciences: HE300\* and four electives;

Language: none;

Special: EM217, EM231, EM232, EM313, EM319, EM324, EE331, EE332, ES410;

Major: SP301, EN201, EN241, EN361, EN362, EN460, EN463, EN465, EN478, EM411, plus two approved electives.

\* Taken during second class summer



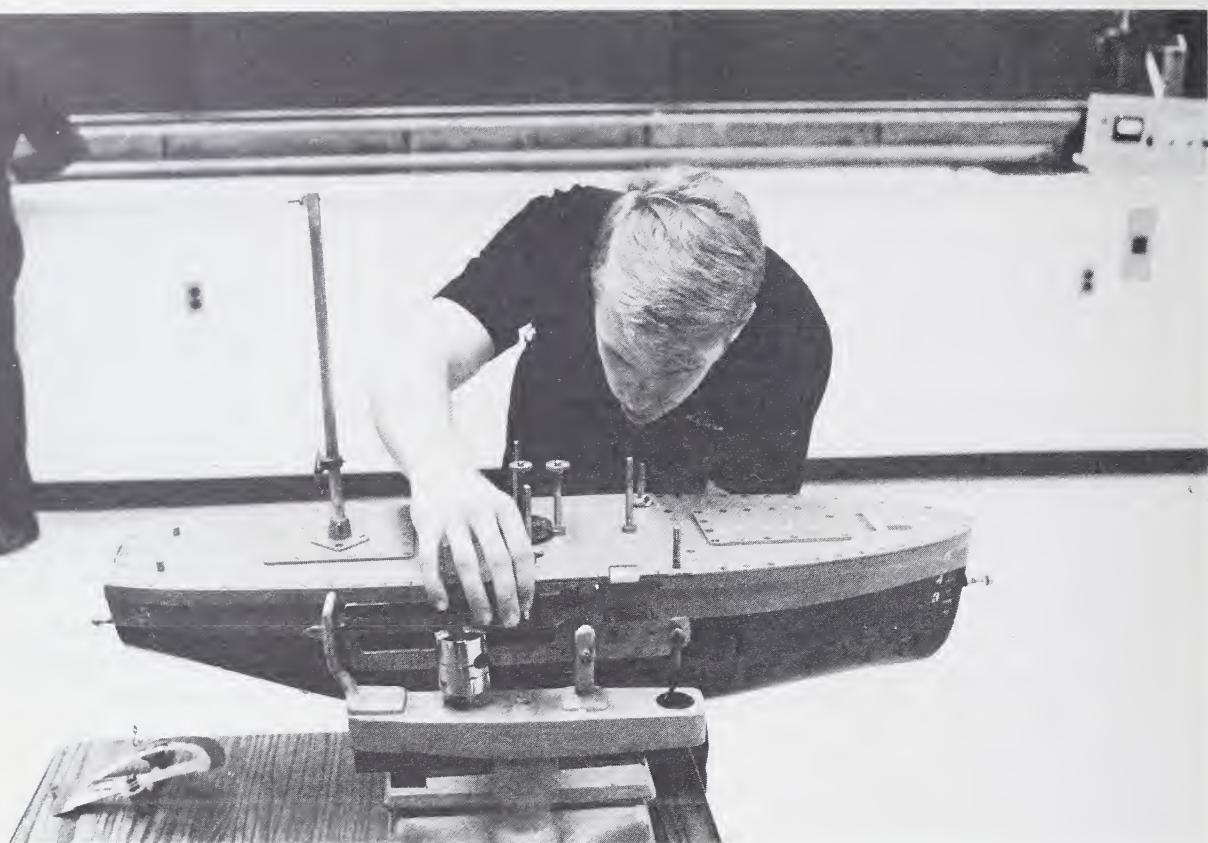
*"None preaches better than the ant, and she says nothing."*

BENJAMIN FRANKLIN

## Naval Architecture Major

Naval architecture, an ECPD accredited major, unlike most engineering disciplines unified by the nature of the phenomena involved, originally came into being as a discipline because of a single end-product, the ship. A special combination of knowledge and experience is needed to develop, design, and build this single product. Variety exists not only in the kinds of work (design, research, cost estimation, management, etc.), but also in the types of craft involved—from sail boats to aircraft carriers, from hydrofoil boats to catamarans, from submarines to air cushion vehicles.

Naval architects use both art and engineering in designing ships. Armed with imagination and experience, they convert functional requirements into a suitable, cost-effective design. They analyze and select the best dimensions and hull form; they calculate the power requirements and estimate the weights of the principal components. They design and analyze the hull structure and decide on the location of military subsystems,



*"Nobody can actually duplicate the strain that a commander is under in making a decision in combat."*

ADMIRAL ARLEIGH A. BURKE

machinery spaces, accommodations, and stores. Additionally, the ship must be divided into watertight compartments so that, if damaged, the chances of survival are maximum. Weighing and compromising all such conflicting needs in the design of the ship are the creative and challenging responsibilities of the naval architect.

Naval architecture at the Naval Academy treats most of the preceding facets through a fully integrated program of classroom sessions, hands-on laboratory work, field trips, and the latest in computer-aided design and analysis techniques. A Bachelor of Science in Naval Architecture is awarded.

**Curriculum Requirements** (In addition to the requirements of plebe year)

Professional: NN203, NS252, NL200, ES300, NN302, NL303, NS300,\* NS400, NL400;

Mathematics: SM211, SM212;

Science: SP211, SP212;

Humanities/Social Sciences: HE300\* and four electives;

Language: none;

Special: EM217, EM231, EM232, EM319, EM324, EE331, EE332, ES410;

Major: EN201, EN241, EN351, EN352, EN356, EN361, EN382, EN453, EN459, EN460, EN478, plus two approved electives.

\* Taken during second class summer

# Ocean Engineering Major

Ocean Engineering, an ECPD accredited major, is the key to the last frontier on earth—the deep ocean. This is an interdisciplinary field involving the application of engineering principles to hardware systems in the ocean environment. The curriculum stresses fundamentals of mathematics, physics, mechanical engineering, electrical engineering, and oceanography, followed by the application of these fundamentals in ocean engineering courses which include analysis of ocean materials, power systems, acoustics, wave mechanics, life-support systems, and a wide variety of ocean vehicles and structures.

Laboratory experiments are conducted in the 120-foot towing tank and coastal engineering tank. Both are equipped with pneumatic wave-maker and instrumented with sophisticated sensors and on-line data acquisition and analysis equipment. The Naval Academy's computer systems are used in solving design problems. Sediment laboratory and environmental chamber facilities are also available. Midshipmen have designed and are building an undersea habitat which will be used as a field laboratory. A Bachelor of Science in Ocean Engineering is awarded.

## Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NN203, NS252, NL200, ES300, NN302, NL303, NS300,\* NL400;

Mathematics: SM211, SM212;

Science: SP211, SP212;

Humanities/Social Sciences: HE300\* and four electives;

Language: none;

Special: EM217, EM231, EM232, EM319, EM324, EE331, EE332, ES410;

Major: SO221, SP411, EN201, EN241, EN361, EN382, EN441, EN460, EN473, EN478 plus three approved electives.

\* Taken during second class summer

\*\* Not offered every year.

## Naval Systems Engineering Courses

**EN100 Introduction to Naval Engineering (2-0-2).** An introduction to the components, function, and basic operation of the various common propulsion systems and auxiliary engineering equipment used by the naval service, including safety considerations involved with shipboard equipment. Also ship's stability, damage control, electrical distribution, hull construction, and hydraulics.

**EN200 Naval Engineering I (3-2-4).** An introduction to ship systems, including basic methods of ship procurement, construction, and powerplant selection. Principles of ship stability and operability as related to preventive and corrective damage control. *Prereq: EN100; Calculus II; Physics I; 3/C cruise.*

**EN201 Engineering Design Graphics (0-2-1).** An introduction to engineering graphical methods and disciplines with emphasis on special visualization and design. Topics include orthographic projection, axonometric drawing, and descriptive geometry.

**EN241 Introduction to Naval Systems Engineering (3-0-3).** This course provides an application of basic mathematics, physics, and mechanics to marine vehicles and static marine systems. It provides a background in naval architecture and

ocean engineering to prepare a midshipman for future major electives offered by the department. Specific topics include ship stability, resistance and powering, maneuvering principles, materials in the ocean, and marine structural principles. *Prereq: 3/C standing.*

**EN300 (301) Naval Engineering II (3-2-4).** A study of naval engineering systems, including the principles of energy conversion; the basic operation of steam, gas turbine, nuclear, and internal combustion engine powerplants; and shipboard engineering department operations. *Prereq: EN100, Calculus II, Physics I, 3/C cruise.*

**EN351 Ship Hydrostatics (3-2-4).** Transverse and longitudinal stability of both surface ships and submersibles are studied. Flooding and stability of ships in the damaged condition are covered. Digital computers are used to solve hydrostatic problems. *Prereq: EN241.*

**EN352 Resistance and Propulsion (3-0-3).** Topics: dimensional analysis, similitude, wave and viscous resistance of ships, ship-model testing techniques, full-scale performance prediction, momentum theory of propulsive devices, and propeller vibrations and design. *Prereq: EN351, EM 324.*



*"I feel better than I would have anywhere else . . . have not had any time to waste. And what I've missed socially, I can always make up."*



*"Men mean more than guns in the rating of a ship."*

JOHN PAUL JONES

**EN356 Ship Structures (3-0-3).** A course in structural theory and practice: Topics include longitudinal and transverse strength of the hull girder, bending moments in a seaway, plate theory, development of the ship's structural design, submarine pressure hull design and shipbuilding materials. *Prereq: EM217, EN351.*

**EN361 Marine Power Systems (2-2-3).** This is a case study type of course in which the students use theoretical thermodynamics and fluid mechanics in order to analyze a typical ship's power plant. Steam and gas turbine plants are covered. Energy from conventional means is studied and energy from nuclear sources is discussed. In the laboratory the student receives a hands-on relationship with steam and gas turbine plants and works out the performance characteristics of the various components. *Prereq: EM319; EM324 concurrent, EN241.*

**EN362 Reactor Physics I (3-0-3).** An introductory course in nuclear reactor theory covering fission, neutron diffusion, material and geometric buckling, and the critical equation. Bare and reflected homogeneous reactors are studied. *Prereq: SM212 or equivalent.*

**EN382 Ocean Materials Science and Engineering (3-2-4).** The course deals with the optimal use of materials in ocean systems with emphasis on corrosion prevention. Laboratory projects include heat treatment, mechanical testing of metals, and corrosion and fouling studies. *Prereq: EM217.*

**EN410 Seafloor Mechanics (2-2-3).** A study of the basic principles of soil mechanics as applied to marine sediments. Topics include shear strength, consolidation, slope stability. *Prereq: EN241 or permission.*

**EN420 Coastal Engineering (2-2-3).** A study of littoral drift and wave action on coastal structures. Topics include littoral drift past a river estuary, breakwaters, jetties, groins, and harbor design. *Prereq: EM217, EN241.*

**EN441 Ocean Engineering Structures (3-0-3).** Structural design considerations for fixed ocean structures, mooring systems, and undersea vehicles are analyzed. Design techniques including matrix methods and finite element analysis are introduced. Boundary conditions, wave effects, foundations, loading, and materials considerations are studied. *Prereq: EM217, EN241.*

**EN453 Seakeeping and Maneuvering (3-0-3).** Topics: ship steering, maneuvering, motion, and seakeeping. The basic equations of motion for a maneuvering ship and for ship motions in a seaway are developed, and various methods of solution are discussed. *Prereq: EN352. Coreq: EN459.*

**EN454 Ship Vibrations (3-0-3).** A ship is a complex elastic structure in which vibration may be caused by periodic forces generated by waves, pro-

pellers, or machinery. The basic concepts of vibration, as well as hull-, propeller-, and machinery-induced vibrations, are considered. *Prereq: EN241.*

**EN456 Computer Applications in Naval Architecture (3-0-3).** An introduction to computer-aided ship design is presented. Topics include numerical procedures applied to form, stability, resistance, propulsion, motion, maneuvering, and strength. *Prereq: Permission.*

**EN457\*\* Hydrofoil and Propeller Theory (3-0-3).** The analysis and design of hydrofoils and marine propellers are presented. Lifting line and lifting surface theories are applied to naval devices. Design and towing tank work supplements recitations. *Prereq: EN352 or permission.*

**EN458 Advanced Marine Vehicles (2-2-3).** Modern watercraft discussed: planing boats, hydrofoil craft, ground-effect machines, and combatant and research submersibles. Analysis and design features are investigated experimentally in the towing tank when appropriate. *Prereq: EN453.*

**EN459 Experimental Naval Architecture (0-4-2).** This course covers the experimental aspects of marine vehicle resistance, propulsion, and seakeeping. Vehicle hydrodynamics as well as experimental methods, data acquisition systems, and technical report preparation are studied and used. *Prereq: EN352. Coreq: EN453.*

**EN460 Ocean Systems Engineering Design (1-4-3).** Conceptual design of a marine system is accomplished by midshipmen teams. The realistic project format followed will involve proposal writing, project manager designation, progress reports, and preparation and design review by experts. *Prereq: 1/C standing, with a technical major.*

**EN463 Reactor Physics II (2-2-3).** The topics covered include neutron generation times, reactor period, delayed neutrons, negative temperature coefficient, xenon poisoning, control rod theory, shielding and, finally, a reactor kinetics case problem. *Prereq: EN362.*

**EN464 Reactor Control Analysis (3-0-3).** Reactor kinetics control theory and the feedback effects. Laplace transforms are used in the analysis of the input/output for a reactor. *Prereq: EN362.*

**EN465 Advanced Marine Power Systems (3-0-3).** A preliminary design of naval powerplants. Through use of a case problem, the student learns to synthesize a large number of machinery elements into a functioning system to give the desired performance. *Prereq: EM324, EN241.*

**EN468 Nuclear Energy Conversion (3-0-3).** Principles of the conversion of nuclear energy into useful power are covered. Various types of nuclear power plants, their design, cycles, load following characteristics, etc. are studied. Direct nuclear energy conversion systems are also studied. *Prereq: EN362.*

**EN470 Life Support Systems (3-0-3).** The physiological and psychological aspects of "man in the sea" are presented with their related engineering requirements. Topics include hyperbaric physiology, saturation diving, life support equipment, deep dive systems, diving operations and hazards. *Prereq: EN241 or permission.*

**EN473 Ocean Engineering Mechanics (2-2-3).** Effects of gravity waves on surfaced and submerged floating bodies and on moored and fixed bodies. Measurement techniques discussed include measurements of wave height, wave-induced forces, and motions in waves. *Prereq: EM324, EN241.*

**EN474 Ocean Energy Conversion (3-0-3).** Covers five ocean energy sources: ocean thermal gradients, wind waves, tides, ocean currents, and salinity gradients. Each source is discussed in terms of the

nature of the resource, the conversion technology, and the environmental consequences of the energy conversion. The potential of each source is compared to those energy sources being presently exploited. *Prereq: EM318 or EM324.*

**EN477\*\* Undersea Power Systems (3-0-3).** The principles of design of undersea power systems are presented. Topics include batteries, fuel cells, chemical-dynamic systems, radioisotopes and nuclear reactor systems, and cable systems. *Prereq: EM332, EM324, EN241.*

**EN478 Seminar in Ocean Systems Engineering (1-0-0).** The seminar will be comprised primarily of lectures and discussion periods with guest lecturers who have major responsibilities in the Navy's ocean systems engineering programs. *Prereq: 1/C standing, EN241.*



*"If all I had to worry about was my studies it probably wouldn't be so bad, but with all the other plebe stuff we have to do I find myself running out of time."*

## Department of Weapons and Systems Engineering

### Systems Engineering Major

This interdisciplinary major is accredited by ECPD and encompasses such diverse fields as electronics, fluids, linear physical systems, automatic control systems, digital computer technology, and system simulation using analog, digital, and hybrid computing systems. An overall understanding of the analysis and design of complete engineering systems, including the various interfaces present, is the primary goal. A Bachelor of Science in Systems Engineering is awarded.

#### Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NN203, NS252, NL200, ES300, NN302, NL303, NS300,\* NL400;

Mathematics: SM211, SM212, SM239;

Science: SP211, SP212;

Humanities/Social Sciences: HE300\* and FE210 plus three electives;

Language: none;

Special: EM214, EM231, EM232, EM318, EM319, EE331, EE332;

Major: ES201, ES303, ES305, ES306, ES309, ES402, ES416, plus five approved electives.

\* Taken during second class summer

#### Systems Engineering Courses

**ES201 Introduction to Systems Engineering (2-2-3).** Illustrations of systems engineering. The selection of mathematical models as real system approximations. Feedback systems. Digital and analog computers. *Prereq: SI101.*

**ES300 Naval Weapons Systems (3-0-3).** An introduction to the theory of weapons systems through a study of the fundamental principles of sensor, tracking, computational, and weapons delivery subsystems. *Prereq: NS101, SM102, SP202, SC104.*

**ES303 Systems Simulation I (2-2-3).** Principles of simulation of linear physical systems are applied using analog and digital computers. *Prereq: ES201; Coreq: ES305.*

**ES305 Systems Engineering Analysis I (3-0-3).** A study of dynamic behavior of physical systems through the solution of differential equation models using transform techniques. *Prereq: ES201; Coreq: ES303.*



*"The Naval Academy  
is a tough place to be  
and a great place to be  
from."*

**ES306 Advanced Systems Simulation (2-2-3).** Simulation of system dynamic response. Continued usage of analog and digital computers as aids to analysis and design, with an introduction to hybrid simulation. *Prereq: ES303, ES305; Coreq: ES309.*

**ES309 Systems Engineering Analysis II (3-0-3).** Analysis and design of linear automatic control systems. *Prereq: ES303, ES305; Coreq: ES306.*

**ES400 Weapons Systems Engineering (3-2-4).** A study of the engineering principles governing the functioning of the various components (detection, control, delivery, and destruction) of naval weapons systems. *Prereq: ES300, 1/C At-Sea Training, EN300, EE312.*

**ES402 Systems Engineering Design (2-4-4).** Introduction to the macro-techniques of engineering design including performance, reliability, management control, redundancy, man-machine systems, and testing techniques. Design, construction, test, and evaluation of an approved project is accomplished in the lab. *Prereq: ES306, ES309.*

**ES406 Information Systems Analysis (3-0-3).** Study of analog information flow and signal-to-noise and signal-to-jamming ratios in communication systems. *Prereq: ES306, ES309.*

**ES407 Hybrid Computer Simulation (1-4-3).** Introduction to hybrid computation, hardware and software consideration of hybrid interface, solution of one and two point boundary value problems, and multiparameter optimization using hybrid techniques. *Prereq: ES306 or consent of instructor.*

**ES408 Digital Technology (2-2-3).** An introduction to logical organization and internal functioning of digital devices applying sequential machine theory, machine language, Boolean algebra and switching circuits. *Prereq: SI102.*

**ES409 Modern Control Systems (3-0-3).** Analysis and design of control systems using modern control theory. *Prereq: ES306, ES309.*

**ES410 Control Systems and Their Application to Weapons (3-2-4).** Linear control systems for engineering majors, using analytical, graphical, and computer techniques. *Prereq: 1/C standing in an engineering major or approval of department chairman.*

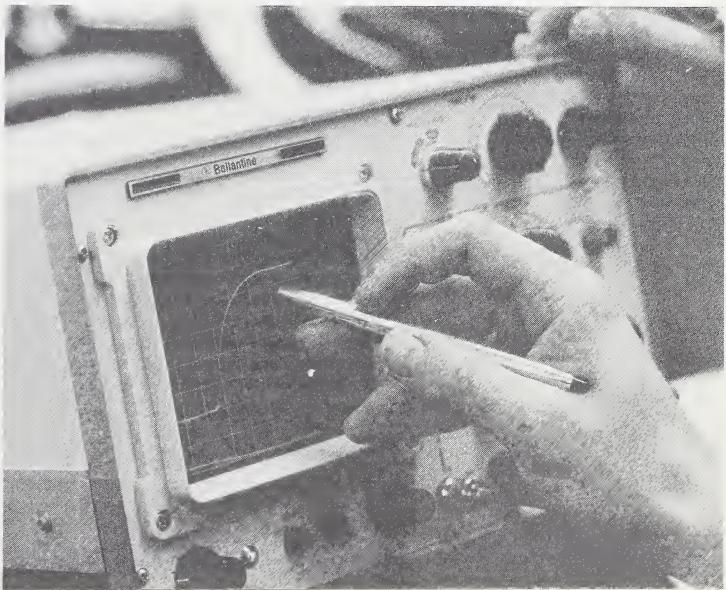
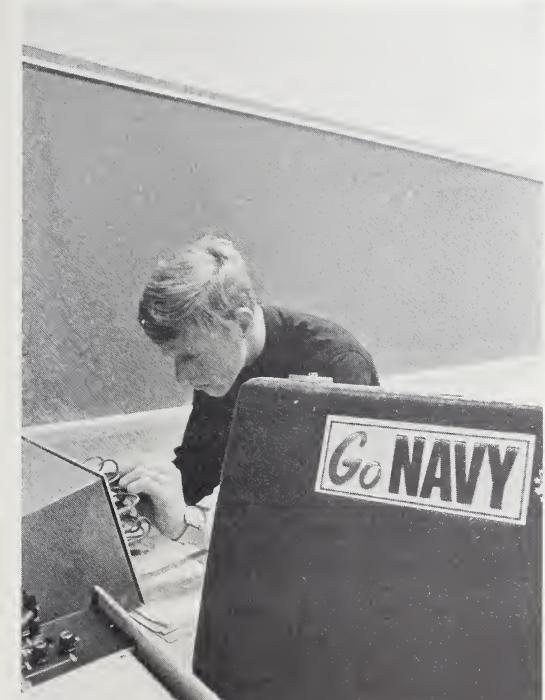
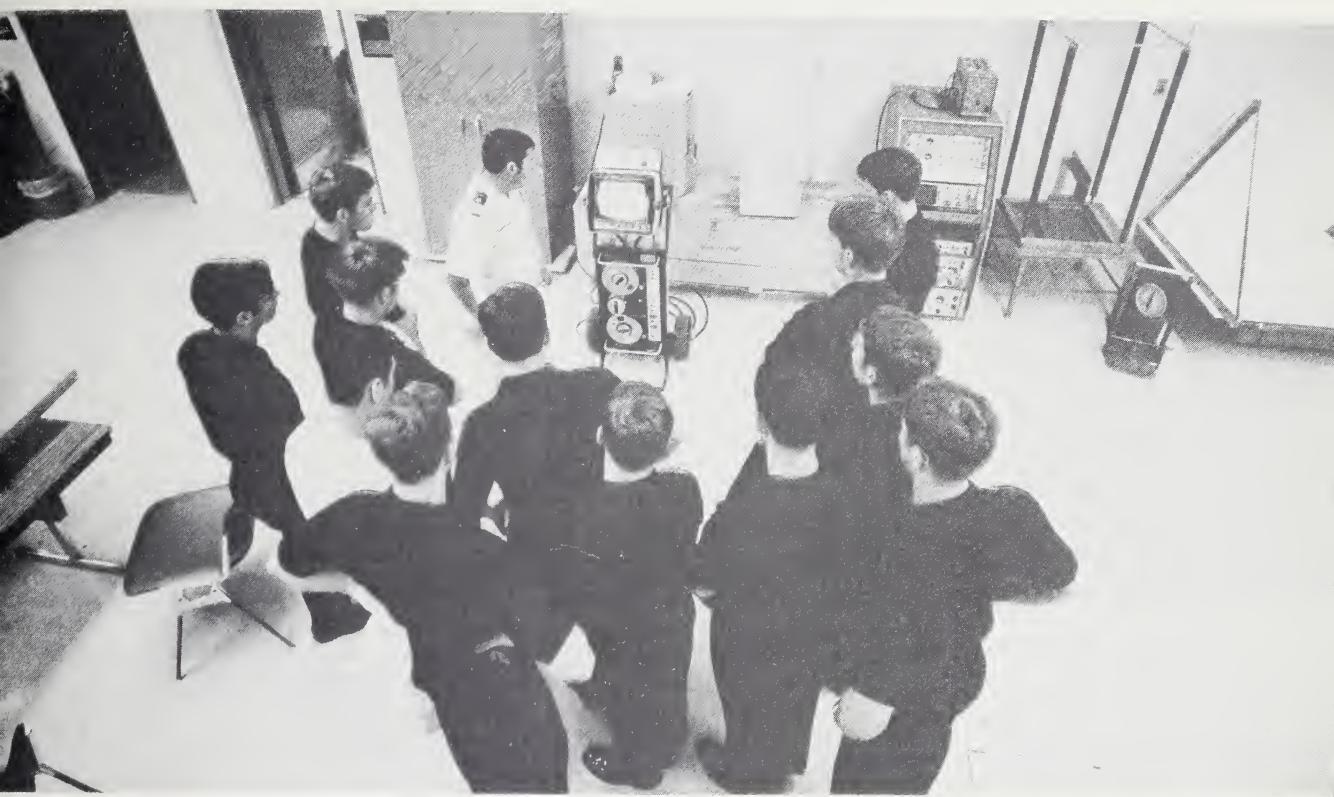
**ES412 Advanced Systems Analysis (3-0-3).** Analysis of digital information and its transfer through communication systems. *Prereq: 1/C standing in an engineering major or approval of department chairman.*

**ES414 Sampled Data and Digital Control Systems (2-2-3).** Response of control systems to discrete and sampled-continuous inputs using the Z-transform transformation techniques. *Prereq: ES306, ES309.*

**ES415 Non-Linear Control Systems (2-2-3).** Analysis and design of control systems having non-linear components. *Prereq: ES306, ES309.*

**ES416 Systems Engineering Analysis III (3-0-3).** Introduction to advanced topics of automatic control systems including state space analysis, non-linear analysis, sampled data, and digital control. *Prereq: ES305, ES309.*







## Division of Mathematics and Science

Department of Mathematics  
Department of Applied Science  
Department of Chemistry  
Department of Oceanography  
Department of Physics

*"The challenge to our country on the seas today is greater than ever before in our history, and only highly motivated, well educated, and thoroughly trained young men will be capable of helping our Navy to answer the challenge."*

VICE ADMIRAL  
WILLIAM P. MACK  
Superintendent,  
U.S. Naval Academy,  
1972-75

### Department of Mathematics

#### Mathematics Major

The major in Mathematics provides students with the opportunity to acquire a sound mathematical foundation and to develop facility in applying mathematical concepts and techniques. The program permits considerable freedom in choice of electives in mathematics as well as computer science, operations analysis, physics, and engineering. A solid background in mathematics facilitates postgraduate specialization in many technical areas, including nuclear power. An undesignated Bachelor of Science degree is awarded.

**Curriculum Requirements** (In addition to the requirements of plebe year)

Professional: NN203, NL200, EN200, NS252, NS300,\* NL303, NN302, EN300, ES300, EE311-312, ES400, NL400;

Mathematics: (See major);

Science: SP211, SP212, and one physics elective;

Humanities/Social Sciences: HE300\* and four electives;

Language: none;

Special: none;

Major: SM201 or SM211 or SM251, SM212, SM261, SM262, SM331, SM332 and four mathematics electives of which two must be at the 400-level. Those midshipmen desiring to devote special attention to the mathematics of operations research may substitute SM239 for SM262. In addition, the following courses will be taken: NA311, NA312, NA411, NA412 and NA431.

\* Taken during second class summer

#### Physical Science Major

The Physical Science major provides students with the opportunity to pursue a broad scientifically oriented program in the field of physical applications of mathematics and science. The major permits midshipmen to experience an inter-disciplinary technical course without the need for specialization. An undesignated Bachelor of Science degree is awarded.

**Curriculum Requirements** (In addition to the requirements of plebe year)

Professional: NN203, NL200, EN200, NS252, NS300,\* NL303, NN302, EN300, ES300, EE311-312, ES400, NL400;

Mathematics: SM201 or SM211, SM212;

Science: SP201 or SP211, SP202 or SP212;

Humanities/Social Sciences: HE300\* and four elective courses;

Language: none;

Special: none;

Major: SO221, SO241, SP301, SP411; two electives from math/computer science; two electives from science/engineering and three from science/mathematics/engineering/computer science.

\* Taken during second class summer

\*\* Not offered every year.

## Mathematics Courses

**SM005 Pre-Calculus Mathematics (4-0-4).** Basic review of algebraic and arithmetic operations, analysis of functions and their graphs, trigonometry. Open only to those students selected by the Mathematics Department. This course does not fulfill any of the mathematics requirements of any major.

**SM101 & SM102 Introduction to Analytic Geometry and Calculus I & II (4-0-4, 4-0-4).** Course content similar to SM111 and SM112. For those not qualified to enroll in SM111.

**SM101T Introduction to Analytic Geometry and Calculus I with Trigonometry (5-0-5).** Same as SM101 plus one semester hour of trigonometry.

**SM111 & SM112 Calculus and Analytic Geometry I & II (4-0-4, 4-0-4).** Plane analytic geometry; differential and integral calculus of one real variable.

**SM111T Calculus and Analytic Geometry I with Trigonometry (5-0-5).** Same as SM111 plus one semester hour of trigonometry.

**SM161 & SM162 Calculus with Computers I & II (5-0-5, 5-0-5).** Programming using BASIC, algorithmic development of the integral and differential calculus of one real variable. *Prereq:* permission of the department chairman.

**SM201 Analytic Geometry and Calculus III (4-0-4).** Course content same as SM211 plus material to strengthen the background of students completing SM102. *Prereq:* SM102 or permission of the department chairman.

**SM202 Elements of Differential Equations (3-0-3).** Course content same as SM212 except for material on the Laplace transform. *Prereq:* SM201, SM211 or SM251.

**SM211 Calculus and Analytic Geometry III (3-0-3).** Solid analytic geometry, series, partial differentiation, and multiple integration. *Prereq:* SM112 or SM162.

**SM212 Differential Equations (4-0-4).** Linear and simultaneous differential equations; solution by Laplace transform and series; partial differential equations and Fourier series. *Prereq:* SM201 or SM211 or SM251.

**SM219 Probability and Statistics (3-0-3).** Nature of statistical methods, description of data, probability, distributions, sampling, estimation, testing hypothesis, correlation and regression. Credit cannot be given for SM219 if credit has been given for SM239 and vice versa. *Prereq:* SM102 or SM112 or SM162; SI100 or equivalent.

**SM239 Probability and Statistics I (3-0-3).** Set theory, probability, distribution functions, standard distributions, joint distributions, sampling and statistics. *Coreq:* SM201 or SM211 or SM251.

**SM251 Calculus with Computers III (4-0-4).** Course content includes and extends that of SM211 with extensive computer applications. *Prereq:* SM162.

**SM259 Mathematical Logic (3-0-3).** Axiomatic systems, formal logic, first-order predicate calculus, quantifiers, deduction theory, recursive functions, axiomatic set theory, Boolean algebra, metamathematics, and intuitionism. *Prereq:* SM102 or SM112 or SM162.

**SM261 Matrix Theory (3-0-3).** Matrices, transformations, bilinear and quadratic forms, linear equations, vector spaces, and characteristic matrix. *Prereq:* SM102 or SM112 or SM162.

**SM262 Modern Algebra (3-0-3).** Integers, groups, mappings, rings, fields. *Prereq:* SM102 or SM112 or SM162.

**SM264\*\* Introduction to Numerical Analysis (3-0-3).** Finite differences and applications; algebraic and transcendental equations; computation with series and integrals; numerical integration; numerical solutions of differential equations; systems of linear equations; difference equations. *Prereq:* SM102 or SM112 or SM162; SI100 or equivalent.

**SM269 Probability and Statistics II (3-0-3).** Estimation, confidence intervals, tests of hypothesis, Bayesian methods, least squares, regression. *Prereq:* SM239.

**SM270 Introduction to Mathematical Economics (3-0-3).** Equilibrium analysis, models, theory of the multiplier, acceleration principle, optimization,



*"Oh man. Like I said, calculus before coming here was something like a Greek word to me. In high school I had only algebra and here I was getting A's in calculus. If somebody told me this before, I would have never believed."*



*"After the prestige of being here wore off I had to ask myself why I was here. But now I look on it as a challenge, and I'm pretty excited about the Academy and the Navy."*

and linear differential and difference equations. *Prereq: SM261.*

**SM271\*\* Linear Programming** (3-0-3). Simplex and dual simplex methods, minimax theorem, integer and parametric programming, transportation problems, and game theory. *Prereq: SM261 or permission of instructor; SI100 or equivalent.*

**SM281 Vector Analysis** (3-0-3). Vectors, vector calculus and fields, line and surface integrals, Stokes, and Gauss' theorems. *Prereq: SM201 or SM211 or SM251.*

**SM311 Engineering Mathematics I** (3-0-3). Fourier series and integral, Frobenius method, Bessel function, Sturm-Liouville theorem, and vector analysis. *Prereq: SM212.*

**SM312 Engineering Mathematics II** (3-0-3). Laplace and Fourier transforms, selected topics from complex variables. *Prereq: SM212.*

**SM315 Introduction to Partial Differential Equation**, (3-0-3). Linear equations, Cauchy problems, Laplace and Poisson equations, boundary value problems, heat equations, Sturm-Liouville problems, and orthonormal expansions. *Prereq: SM212.*

**SM331 Advanced Calculus I** (4-0-4). Set theory, real number systems, Euclidean spaces, topological concepts, compact and connected sets, continuous mappings, uniform convergence. *Prereq: SM261.*

**SM332 Advanced Calculus II** (4-0-4). Differentiation, mean value theorem, Taylor's theorem, inverse and implicit function theorems, extremal problems with and without constraints, integration, multiple integrals. *Prereq: SM331.*

**SM400 Calculus/Differential Equations for Nuclear Power Selectees** (4-0-4). Partial differentiation, multiple integration, linear and simultaneous differential equations, topics from vector analysis. Enrollment restricted to selectees for nuclear power who have not completed SM212. Selectees who have completed Calculus III with a grade of A or B may enroll in SM212 instead of SM400.

**SM411 Introduction to Complex Variables** (3-0-3). Number field, Cauchy-Riemann differential equations, analytic functions, series, singularities, residues, conformal mapping, and continuation. *Prereq: SM331 or Coreq: SM322.*

**SM425\*\* Advanced Numerical Analysis** (3-0-3). Series, truncation error, iterative methods, matrices, characteristic values, quadratures and difference equations. *Prereq: SM261; SM311 or SM315 or SM321 or SM331; SI100 or equivalent.*

**SM426 Numerical Methods for Differential Equations** (3-0-3). Existence and uniqueness of solutions, finite difference approximations for derivatives, one-step and multi-step methods, estimation of error, stability, boundary value and eigenvalue problems, partial differential equations. *Prereq: SM331 or SM315 or SM321 or SM331; SI100 or equivalent.*

**SM433 Methods of Applied Mathematics** (3-0-3). A course in mathematical methods applicable to problems in physics, engineering, control theory, and operation analysis. Linear spaces, calculus of variations and integral equations. *Prereq: SM331 or permission of department chairman.*

**SM461 Linear Algebra** (3-0-3). Vector spaces, linear transformations, Jordan canonical form, inner product spaces. *Prereq: SM261; SM321 or SM331 and permission of instructor.*

**SM462 Algebraic Structures** (3-0-3). Groups, rings, fields, Galois theory. *Prereq: SM262; Coreq: SM321 or SM331, or permission of instructor.*

**SM464 Topology** (3-0-3). Sets, functions, metric and topological spaces, and Banach spaces. *Prereq: SM262; Coreq: SM322 or SM332 and permission of instructor.*

**SM465 Advanced Differential Equations I** (3-0-3). Existence, uniqueness and oscillation theorems, stability, topological methods. *Coreq: SM423, and permission of instructor.*

**SM468 Measure and Integration** (3-0-3). Construction, properties and extensions of measures, Lebesgue-Stieltjes measure, integrals, Fubini and Nikodym theorems, Daniell integral, relation to probability theory. *Prereq: SM423 and permission of instructor.*

# Department of Applied Science

## Resources Management Major

The major in Resources Management provides both a fundamental science program and a basic foundation in the interactions between management and the control and allocation of resources. An undesignated Bachelor of Science degree is awarded.

### Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NN203, NL200, EN200, NS252, NS300,\* NL303, NN302, EN300, ES300, EE311-312; ES400, NL400;

Mathematics: Calculus III, SM212, SM219;

Science: SP201, SP202;

Humanities/Social Sciences: HE300,\* FE210, one economics elective plus two other electives;

Language: None;

Major: EN201, NM211, NM213, EM221, EM222, NM411, NA311, NM312, EM327, NM401, EM328 and two major electives.

\* Taken during second class summer

\*\* Not offered every year.



### Resources Management Courses

**NM211 Fundamentals of Resources Management (3-0-3).** This introductory course complements the science portion of the major with specific administrative procedures and approaches required to insure economical and efficient use of men, money, and materials.

**NM213 Accounting (3-0-3).** An introductory course in the basic principles of accounting.

**NM304 Personnel Management (3-0-3).** Emphasizes theory and fundamentals of personnel administration. Military and civilian personnel practices are examined and evaluated. *Prereq: NM211.*

**NM312 Financial Management (3-0-3).** A study of the theory and techniques of financial management applied in the federal government and industry. *Prereq: NM213.*

**NM401 Material Management (3-0-3).** Examines concepts of integrated logistics and life cycle support, requirements determination, procurement and contract administration and inventory control, with primary emphasis on quantitative techniques. *Prereq: NM212, NM213.*

**NM411 Management Information Systems (3-0-3).** Professional applications of military computerized information systems and a presentation of the concepts utilized in their development and operation. *Prereq: NM401.*

**NM412 Advanced Studies in Management (3-0-3).** Advanced course in administrative policies and practices. Case studies and outside readings emphasize the management process and executive development. *Prereq: NM304, NM312.*

**NM413 Management Practicum (3-0-3).** A problem solving seminar based on the theoretical constructs of previous management education. *Prereq: NM312.*

**NM421 Cost Accounting (3-0-3).** A study of the concepts and techniques of cost accounting. Primarily concerned with the derivation of product cost arising from materials, labor, services employed, and overhead. *Prereq: NM312.*

### Operations Analysis Courses

**NA311 Analysis of Naval Tactics (3-2-4).** An introduction to the techniques of modeling and quantitative analysis applied to specific naval operational problems, including search and patrol, screening, anti-air warfare, mining, equipment reliability and decision rules. *Prereq: SM239 or SM219.*

**NA412 Methods of Operations Analysis I (3-0-3).** Investigation of linear programming and an introduction to integer programming via Gomory's cutting plane algorithm as well as network analysis and deterministic dynamic programming are introduced. *Prereq: SM261.*

**NA411 Methods of Operations Analysis II (3-0-3).** An introduction to nonlinear programming, discrete parameter Markov chains, nondeterministic dynamic programming, and queueing theory. Stress is given to applications of typical operations analysis problems. *Prereq: SM239 and SM261.*

**NA412 Applications of Operations Analysis (2-2-3).** Operations research techniques are applied

*"I've always believed that women should remain superior, rather than becoming equal to men."*

BLANCH HOWARD WENNER,  
First registrant for first  
college entrance examination,  
conducted (1901) by College  
Entrance Examination Board



*"When I first came here, I tried to be obscure, but that only made me stand out more. To make it here, you have to be outgoing, to let people know you."*

using student projects, case studies and visiting lecturers to relate the applications of operations analysis techniques to current military and industrial problems. *Prereq: permission of manager of study group.*

**NA421\*\* Games of Strategy and Gaming (2-2-3).** Introduces game theory as limited to two-person, zero-sum games. Introduces manual, man-machine, and machine games as tools for obtaining complex problem solutions. *Prereq: SM239 and SM261.*

**NA431 Decision Theory (3-0-3).** A mathematical study of the decision-making process with particular emphasis on min-max and Bayes strategies and hypothesis testing using regression, correlation, analysis of variance, and non-parametric methods. *Prereq: NA441.*

**NA432 Logistics (3-0-3).** Introduces techniques of operations analysis applicable to the solution of logistics problems. *Prereq: SM239 and NA311 or NA312.*

**NA441 Applied Statistics (3-0-3).** The application of statistical methods for determining the general characteristics of a body of data, summarizing and analyzing such data using such techniques as estimation, hypothesis testing, analysis of variance, regression and correlation. *Prereq: SM239.*

### Computer Science Courses

**SI100 Introduction to Computing (2-0-2).** A first course in computer science for students in all majors. Programming in the BASIC language including techniques for arrays, character manipulation, file handling, and subprograms.

**SI201 FORTRAN with Scientific and Engineering Applications (3-0-3).** Intended to meet the computing needs of scientific and engineering majors. Includes programming problems dealing with physics, mathematics, probabilities and statistics, and various engineering applications. *Prereq: SI100.*

**SI211 Advanced Programming (3-0-3).** Machine and assembly language, compilers and interpreters.

Program segmentation and linking. Macros, subroutines, and utility routines. Input/output, peripheral devices, and auxiliary storage. Program efficiency and documentation. *Prereq: SI100.*

**SI301 Data Structures (3-0-3).** Data representation and information management. Lists, strings, arrays, trees, graphs. Storage structures, allocation, and collection. Sorting techniques, symbol tables, and searching. *Prereq: SI100.*

**SI302 Fundamentals of Computer Logic (3-0-3).** Applications of Boolean algebra to switching circuits, number representation, and logic networks. Minimization techniques. Analysis of fundamental computer circuits. *Prereq: SI100.*

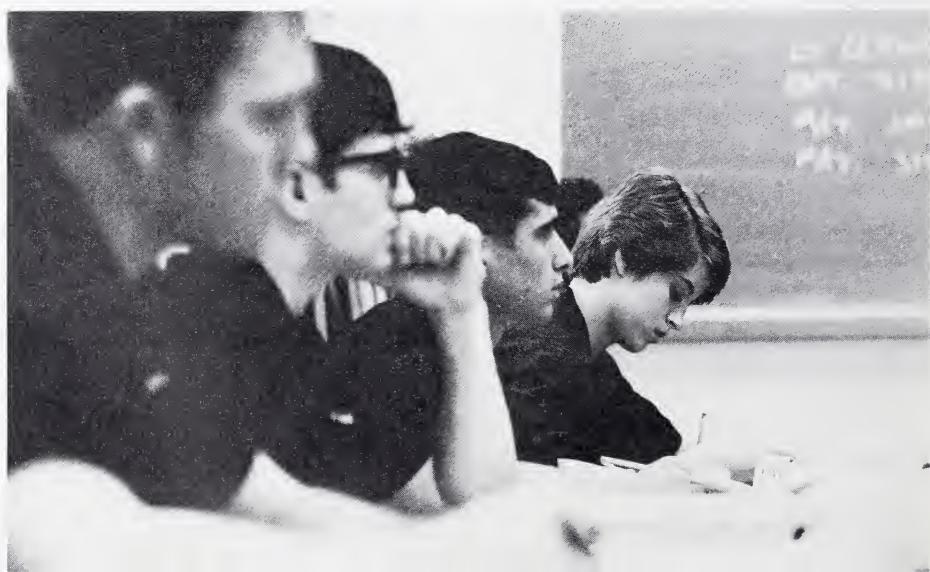
**SI304 Programming Languages (3-0-3).** Functional and technical characteristics of algorithmic, problem-oriented, list processing, string manipulating, and simulation languages. Survey of important programming languages. *Prereq: SI100.*

**SI412 Compiler Construction (3-0-3).** Study of techniques involved in the analysis of source language and generation of efficient object code. *Prereq: permission of instructor.*

**SI421 Discrete Simulation (3-0-3).** Simulation and modeling of discrete systems. Introduction to queueing theory and stochastic processes. Comparison of simulation languages. Design, analysis, and validation of simulation models. *Prereq: permission of instructor.*

**SI431\*\* Computer Organization (3-0-3).** Organization, logic design, and components of digital computing systems. Overall organization of modules into a system. *Prereq: SI302 or permission of instructor.*

**SI432 Computer Systems Management (3-0-3).** Planning, specification, and procurement of a computer system under DOD rules. Organization and management of a computer center. *Prereq: SI431 or permission of instructor.*



# Department of Chemistry

## Chemistry Major

Chemistry, an experimental science, is the most laboratory-oriented program offered at the Naval Academy. The laboratory facilities of Michelson Hall are unexcelled at the undergraduate level. Serious students of chemistry have ample opportunity to experiment and observe as they pursue the scientific method. Laboratory equipment includes single-pan balances, gas chromatographs, mass spectrometer, X-ray diffraction, and nuclear magnetic resonance spectrometers.

Any naval officer will profit from a good knowledge of chemistry. A background in the fundamental principles of chemistry and modern experimental techniques is highly valuable for naval officers working in such technical subspecialties as oceanspace research, life sciences and support systems, propellants, and many others.

The Chemistry major is approval by the American Chemical Society. An undesignated Bachelor of Science degree is awarded.

### Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NN203, NL200, EN200, NS252, NS300,\* NL303, NN302, EN300, ES300, EE311-312, ES400, NL400;

Mathematics: SM211, SM212;

Science: SP211, SP212;

Humanities/Social Sciences: HE300\* and four electives;

Language: none;

Special: two free electives;

Major: SC201, SC202, SC301, SC321, SC302, SC304, SC322, SC401L, SC402L, and one non-specified chemistry elective.

\* Taken during second class summer

### Chemistry Courses

**SC103 & SC104 Elements of Chemistry** (3-2-4, 3-2-4). A two-semester sequence presenting the fundamental laws and theories of chemistry. Atomic and molecular structures, periodicity, chemical equilibrium, kinetics, and electrochemistry are covered in a balanced classroom and laboratory development for the student with a limited chemistry, mathematics, and science background.

**SC105 & SC106 General Chemistry** (3-2-4, 3-2-4). A two-semester sequence stressing the fundamental laws and theories of chemistry. Topics include atomic and molecular structures, bonding, chemical thermodynamics, equilibrium, kinetics, acids and bases, and electrochemistry. Laboratory emphasis is on development of scientific laboratory skills, particularly the generation, analysis and presentation of data. *Prereq: one year of high school chemistry.*

**SC113 and SC114 Principles of Chemistry** (3-2-4, 3-2-4). A rigorous course in the fundamental principles underlying the areas of inorganic, organic, and physical chemistry designed for students with above average aptitude and ability in the sciences. *Prereq: one year of high school chemistry.*

**SC201 & SC202 Organic Chemistry** (3-6-5, 3-6-5). The chemistry of covalent compounds of carbon, including aromatic, aliphatic, and heterocyclic. The second semester laboratory includes qualitative organic analysis. Special attention is given areas of petroleum, plastics, drugs, and spectroscopy. *Prereq: SC114, SC106, or SC104.*

**SB251 General Biology I** (3-2-4). Fundamental principles are introduced. Topics include protoplasm, plant and animal histology, plant and animal metabolism, gametogenesis, and cell division, as well as genetics, ecology, and organic evolution.

**SB252 General Biology II** (3-2-4). Expands upon topics from General Biology I, particularly plant and animal metabolism, and introduces vertebrate morphology and physiology.

**SC301 & SC302 Physical Chemistry** (3-0-3, 3-0-3). An introduction to the physical states of matter, kinetic theory of gases and liquids, thermodynamics, phase equilibria, properties of solutions, atomic and molecular structure. *Prereq: SM211, SP212.*



*"Civilizations which have developed very diverse traditions and diverse ways of life during the centuries for which they have been living in isolation have now suddenly been brought within point-blank range of one another. Their atomic missiles are now poised head to head, while their minds and hearts are still poles apart."*

ARNOLD J. TOYNBEE







*"I was going to write something profound (about being a plebe) for the catalog, but I found that I didn't have time to do it."*

**SC304 Instrumental Methods of Analysis (2-6-4).** The theory and applications of modern instrumental methods of analysis are stressed. A wide array of sophisticated instruments is available for student use. *Prereq: SC301, SC321.*

**SC321 Quantitative Analysis (2-6-4).** A study of volumetric, gravimetric, and modern optical and electrical methods of analysis. Theory and laboratory procedures and techniques are stressed. *Prereq: SC114 or SC106.*

**SC322 Inorganic Chemistry I (3-0-3).** An in-depth study of fundamental concepts including

topics in atomic structure, chemical bonding and coordination chemistry. *Prereq: SC302.*

**SC401L & SC402L Physical Chemistry Laboratory (0-3-1, 0-3-1).** A comprehensive, sophisticated laboratory course designed to give practical laboratory experience in the areas covered in courses SC301 and SC302. *Prereq: SC302, SC321.*

**SC432 Biochemistry (3-0-3).** The biological chemistry of the human body is discussed, including both normal and abnormal aspects. Metabolism, nutrition, vitamins, and hormones are included. *Prereq: SC201.*

## Department of Oceanography

### Oceanography Major

Oceanography is an inter-disciplinary science major involving the study of meteorology, geophysics, physics, chemistry, biology, and geology as they relate to our ocean environment and the effects of that environment on naval operations. It is a laboratory-oriented program with the most modern facilities, including an oceanographic research vessel, a field laboratory, a weather station and radiosonde system for study of the atmosphere, plus a wave tank, a rotating tank, demonstration tank, atmospheric chamber, tide gauges, marine culture systems, and fully equipped laboratories. An undesignated Bachelor of Science degree is awarded.

#### Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NN203, NL200, EN200, NS252, NS300,\* NL303, NN302, EN300, ES300, EE311-312, ES400, NL400;

Mathematics: SM201 or SM211, SM212, SM219, SM311;

Science: SP211, SP212;

Humanities/Social Sciences: HE300\* and four electives;

Language: none;

Special: none;

Major: SB251, SO241, SO261, SO313, SP322, SO413, SO424, SO482 and SP411 plus two approved electives.

\* Taken during second class summer

\*\* Not offered every year.

#### Oceanography Courses

**SO221 Introduction to Oceanography (3-0-3).** Examines those aspects of oceanography and meteorology which pertain directly to engineering applications. *Prereq: SC104, SC106 or SC114; SP201 or SP211.*

**SO241 General Meteorology (3-0-3).** Introductory study of the atmosphere. *Prereq: SM201 or SM211, SP201 or SP211.*

**SO261 Physical Geology (3-2-4).** A study of the solid earth including the composition and prop-

erties of rocks and minerals. Development of the landscape by geological processes is emphasized.

**SO313 General Oceanography (3-2-4).** An introductory study of the ocean. *Prereq: SB151, SC106 or SC114, SG161, SM201 or SM211, SP211.*

**SO412\*\* Environmental Instruments (2-2-3).** A study of theoretical and practical characteristics of instruments used in collecting oceanographic and meteorological data. *Prereq: SO313 or SO221; SO241.*

**SO413 Oceanic and Atmospheric Processes (3-0-3).** The dynamics of quasi-horizontal, inviscid flow on the rotating earth. The motions of interest are isolated through the use of scale analysis of the governing equations. *Prereq: SO322.*

**SO415 Environmental Pollution (2-2-3).** Concerns environmental problems involving air and water. Topics include pollution sources and control, climatology, solid wastes, recycling, noise, and legal aspects. Laboratory work includes field trips and pollution surveys. *Prereq: SO313 or SO221, or permission of department chairman.*

**SO422 Nearshore Oceanography (2-2-3).** Examines the oceanographic regime from the continental break to the intertidal zone, concentrating on shallow water wave, surf, and beach processes. *Prereq: SO221 or SO313.*

**SO424 Waves and Tides (3-0-3).** The dynamics of surface and internal wave phenomena in the oceans and atmosphere and an examination of wind-generated wave characteristics and prediction methods. *Prereq: SO413.*

**SO441 Synoptic Meteorology (2-2-3).** A practical course in meteorological analysis and forecasting as applied to operational planning. *Prereq: SO241.*

**SO442\*\* Tropical Meteorology (2-2-3).** A study of the special processes affecting meteorological analysis and forecasting in the tropics with particular emphasis on hurricane/typhoon prediction, creation, movement, and decay. *Prereq: SO241.*

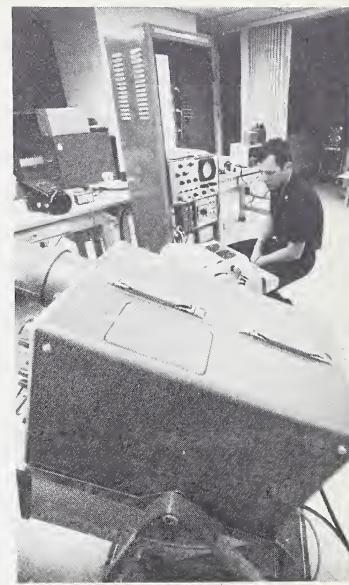
**SO444 Climatology (3-0-3).** A climatic approach to weather phenomena. *Prereq: SO241.*

**SO451 Biological Oceanography (2-2-3).** An introduction to the ocean as a biological environment. Laboratory work includes practical studies of the biology of the Chesapeake Bay. *Prereq: SO313 or SO221, or permission of department chairman.*

**SO461 Geological Oceanography (2-2-3).** Introduction to marine geological methods, instrumentation and applications. Processes of marine erosion and deposition, marine sediment types and distributions. Origin, structure, and geomorphology of the ocean basins and continental margins. *Prereq: SO261 or permission of department chairman.*

**SO463 Current Topics in Oceanography and Meteorology (3-0-3).** Provides an opportunity to present current material pertinent to oceanography and meteorology and their application to areas of Navy interest. *Prereq: SO313.*

**SO471 Chemical Oceanography (2-2-3).** The modern approach to the ocean as a chemical system. Laboratory instruction emphasizes principles rather than specific methods. Classical concepts are discussed, as well as newer trends. *Prereq: SO313 or SO221 or permission of department chairman.*



*"The superior man is firm in the right way, and not merely firm."*

CONFUCIUS

## Department of Physics

### Physics Major

The major program in Physics: (1) presents fundamental physical concepts and principles in such a way as to emphasize their general usefulness and (2) lays a strong foundation for further work in a broad range of technical fields. Some of the topics treated in the sequence of courses are the origin, propagation, and reception of waves of all kinds; field concepts; theory of relativity; basic theory of quantum mechanics; and statistical mechanics. All are studied with the object of providing an open-minded and creative approach to the physical world—an approach increasingly important to those who will be leaders in our modern Navy. A solid background in physics achieved at the Academy will facilitate subsequent specialization in any technical area. An undesignated Bachelor of Science degree is awarded.

#### Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NN203, NL200, EN200, NS252, NS300,\* NL303, NN302, EN300, ES300, EE331-332, ES400, NL400;

Mathematics: SM211, SM212, SM311, SM312;

Humanities/Social Sciences: HE300\* and four elective courses;



Language: none;

Special: none;

Major: SP221, SP222, SP226, SP331, SP341, SP324, SP425, SP444, SP482, plus two physics electives and one elective from engineering, science, or mathematics.

\* Taken during second class summer

## Physics Courses

**SP201 & SP202 Basic Physics I & II** (3-2-4, 3-2-4). Introduces the basic concepts of kinematics, dynamics, heat & thermo-dynamics, wave motion, sound, optics, electricity, and magnetism. *Prereq: SM101 for SP201; SP201 for SP202.*

**SP211 & SP212 General Physics I & II** (3-2-4, 3-2-4). Emphasizes the fundamental principles of classical physics; however, contemporary applications are introduced as appropriate. The topics covered are mechanics, electricity, magnetism, wave motion, thermodynamics, sound, and light. *Prereq: Calc. I for SP211; SP211 for SP212.*

**SP221 Physical Mechanics I** (3-2-4). The first course in physics for majors in physics. This course provides the basic classical mechanics for further study in physics. *Prereq: SM111 or approval of department chairman.*

**SP222 Electricity and Magnetism I** (3-2-4). A first course in electricity and magnetism with emphasis on the concepts of fields and potential. The course culminates in the formulation of Maxwell's equations. *Prereq: SP221 or SP211.*

**SP226 Heat, Sound and Light** (3-2-4). Develops the basic concepts in heat, sound and light. The coherency of the basic concepts in physics is emphasized. *Prereq: SP221.*

**SP301 Modern Physics** (3-0-3). An introduction to relativistic mechanics and the particle aspects of electromagnetic radiation. Emphasis on the decay of unstable nuclei and nuclear reactions.

**SP311 Astronomy I** (3-0-3). The fundamentals of astronomy as a physical and mathematical science, with particular emphasis on the planets, moon, comets, meteors and the solar system as a whole. Occasional observing sessions. *Prereq: SP202 or SP212 or SP222.*

**SP312 Astronomy II** (3-0-3). The application of fundamental physics to the wider vistas of the stars, the galaxy, and sidereal universe. Topics in stellar evolution and cosmology. Occasional observing sessions. *Prereq: SP202 or SP212 or SP222.*

**SP321 Wave Physics** (3-2-4). An introductory course for physics and engineering physics majors in such wave phenomena as reflection, refraction, interference, and diffraction. Applications are made to both acoustics and optics. *Prereq: SP221 or SP211.*

**SP324 Physics of the Atom I** (3-2-4). A first course in atomic and nuclear physics for majors in

physics. Topics covered are special relativity, black body radiation, photon theory of radiation, development of Rutherford and Bohr atoms, wave properties of matter, and introduction to quantum theory. *Prereq: SP321, SM212; Coreq: SM311 or permission of the instructor.*

**SP328 Fluid Physics** (3-0-3). A first course in classical fluid mechanics which addresses the fundamentals of inviscid, incompressible flow dynamics, circulation, vorticity, and turbulent flow. *Prereq: SP212, SM311, SP313 or permission of department chairman.*

**SP330 Physical Mechanics II** (3-0-3). Physical mechanics at the intermediate level intended to provide a basis for further study in either classical or quantum physics. *Prereq: SP221, SM212.*

**SP331 Physical Mechanics** (4-0-4). Physical mechanics at the intermediate level intended to provide a basis for further study in either classical or quantum physics. *Prereq: SP221 or SP211, SM212.*

**SP341 (431) Electricity and Magnetism II** (3-0-3). A course in electromagnetic theory required for all majors in physics and electrical engineering. Maxwell's equations are formulated in the notation of vector analysis and applied to various situations. *Prereq: SP222 and SM311.*

**SP411 Underwater Acoustics and Sonar** (3-0-3). A fundamental study of sound propagation in the ocean environment as it relates to the design and operation of sonar. *Prereq: SP202, SP212, or SP321.*

**SP425 Physics of the Atom II** (3-2-4). The formalism of quantum mechanics. Quantum theory of angular momentum; application to specific heats of gases, hydrogenic atoms. Quantum treatment of multi-electron atoms; applications to atomic and molecular spectra, solids, quantum statistics. Introduction to nuclear physics. *Prereq: SP324, SM311.*

**SP434 Nuclear Physics** (3-2-4). A study of the basic static and dynamic properties of the nucleus and of the interaction of particles and radiation with matter with emphasis on the experimental techniques. Where appropriate, quantum mechanical interpretations of the phenomena are given. *Prereq: SP425.*

**SP436 Acoustics** (3-2-4). An introduction to modern acoustics. The topics included are normal modes and boundary value problems, discrete Fourier transform, radiation, transmission and detection of sound waves, electro-acoustics, physcho-

*"Looking back over the four years I've been here, I've enjoyed it ... every minute of it."*

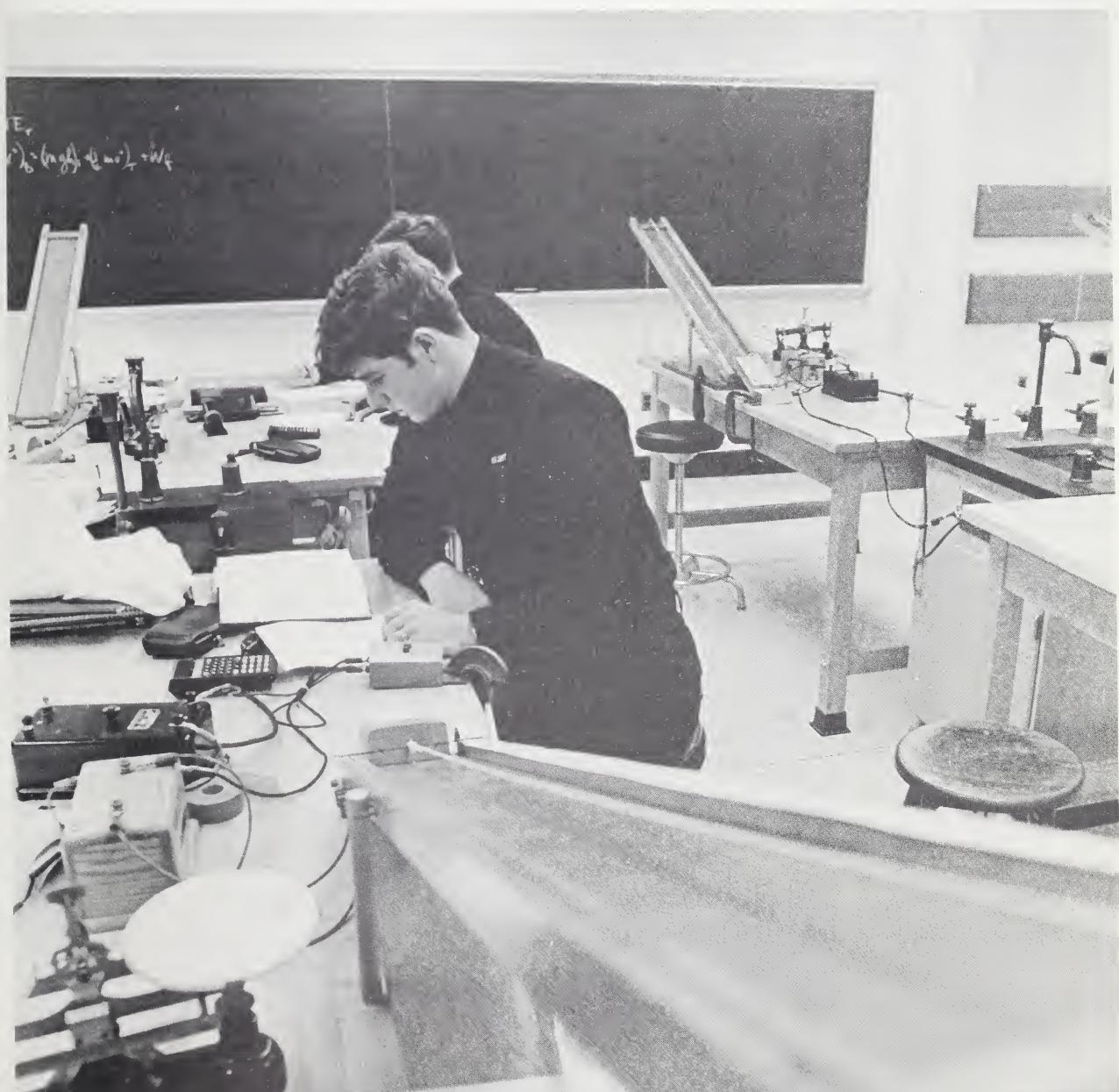
acoustics, architectural acoustics, and underwater acoustics. *Prereq: SP211 or SP321 and SM212.*

**SP438 Optics (3-2-4).** Introduction to modern optics including the use of Fourier transforms in the study of diffraction, the concepts of partial coherence, interference theory, holography, polarization, and the optics of solids. *Prereq: SP321, SP431.*

**SP440 Solid State Physics (3-0-3).** An introductory course in physics of the solid state. The topics included are crystal structures, thermal properties, free electron model, band theory, magnetism resonance, and semiconductors. *Prereq: SP324.*

**SP444 Thermal Physics (3-0-3).** A presentation of classical thermodynamics followed by kinetic theory and statistical thermodynamics. *Prereq: SP425, or permission of the department chairman.*

**SP445 Stellar Astrophysics (3-0-3).** A study of the basic physics of stellar properties and processes: mass, luminosity, stellar spectra, chemical composition, stellar energy sources, nucleosynthesis, stellar evolution, and stellar models. *Prereq: SP301 or SP324.*





## Division of English and History

Department of English  
Department of History

### Department of English

#### English Major

The major program in English offers study of some of the most significant and influential writings of civilization from ancient times to the present, as well as the opportunity for independent study and for creative writing projects. A special feature of the program is that the literature of virtually all major countries and cultures is considered, in contrast to traditional offerings which are normally restricted to British and American literature. An undesignated Bachelor of Science degree is awarded.

##### **Curriculum Requirements** (In addition to the requirements of plebe year)

Professional: NN203, NL200, EN200, NS252, NS300,\* NL303, NN302, EN300, ES300, EE311-312, ES400, NL400;

Mathematics: Calculus III, Differential Equations;

Science: SP201, SP202;

Humanities/Social Sciences: HE300\* and two elective courses;

Language: Four semesters of a modern language;

Special: none;

Major: HE333, HE442 plus eight approved major electives.

\* Taken during second class summer

\*\* Not offered every year.

#### English Courses

**HE101 Practical Writing** (2-0-2). The study and practice of grammatically correct and rhetorically effective expository prose, supplemented by the analysis of essays by professional writers. For students selected by English Department.

**HE111-112 Rhetoric and Introduction to Literature I & II** (3-0-3); (3-0-3). Stresses the writing of rhetorically effective and grammatically correct expository prose. Readings during the first semester include short prose and plays; during the second, novels and poetry. During the first semester students write short essays (up to 500 words) and become acquainted with research procedures and the library; during the second semester, they write longer essays and a research paper.

##### **200-Level Courses: General Description**

The literary content of courses on this level is eclectic. These courses offer wide surveys of mate-

rials from different cultures, historical periods, literary types and issues. In each course, substantial practice in writing is to be expected; if a term paper is required, prior to the submission of such a paper there will also be several essays or written exercises to test and evaluate the student's writing competence. No pre-requisites for any course in the 200 group; they may be taken at any class level, including the fourth class year.

**HE219 The Literature of Classical and Christian Ideas** (3-0-3). The foundations of modern literature in the literature of classical Greece and Rome and medieval Europe. Readings in mythology, philosophy, the epic, drama, and poetry. Attention will be given to the traditions, ideas, and conventions which have shaped the development of Western literature.

**HE222 The Bible and Literature** (3-0-3). Studies in the Bible and its influence on European and

**American literature.** Emphasis will be placed on modern Biblical literary-critical methodology and in the symbolic richness of derivative literature from Dante to Bernard Malamud.

**HE223 Modern World Literature (3-0-3).** Readings in the literature of contemporary cultures throughout the world, notably in the twentieth-century literatures of South America, Africa, Japan, and the Near East, as well as of the United States and Europe. The literature of the current world scene as it will be experienced by the modern professional officer.

**HE224 Literature and Science (3-0-3).** The interrelationships among science, technology, and literature since the Renaissance. The impact of science on literature and the implications of science as reflected in literary responses.

**HE231 Literature of American Minorities (3-0-3).** The problems and contributions of American minorities (Indian, Mexican-American, Puerto Rican, etc.), as reflected in current literature.

**HE240 American Black Literature (3-0-3).** Provides an historical survey of American black literature from the colonial period to the present. Major figures including Toomer, Hughes, Wright, Ellison, Baldwin, Baraka, and Brooks are stressed.

**HE250 Literature of the Sea (3-0-3).** Study of the principal genres of the literature of the sea (an epic, novels, shorter fiction, and poetry). Emphasis on literary qualities, man's relationship with the sea, and problems of command.

**HE260 Introduction to Mass Communications (3-0-3).** An introduction to the nature of mass communicators and their audiences. The effects of mass

communication on the individual and society. The historical development of mass communication. The future of mass media.

### 300-Level Courses: General Description

These courses build on the foundations of literary analysis, comprehension, and writing acquired in HE111-112. The HE301-306 series goes more deeply into each of the basic literary types; the HE313-333 series approaches literature in its historical-cultural dimension while focusing on a limited historical period; the HE343-344 series offers extensive practice in a variety of writing forms. All courses, however, have a writing requirement intended to further the student's opportunity to improve skills. Prerequisites for all 300 level courses are HE111-112.

**HE300 Public Communication (1-0-1).** Indoctrination in the junior officer's role in the Navy's public affairs program. Practice in speaking in various situations. Taken during 2/C summer.

**HE301 Patterns in Drama (3-0-3).** Reading, viewing and analysis in a variety of dramatic experiences for the purpose of exploring the relationships among language, action, and form.

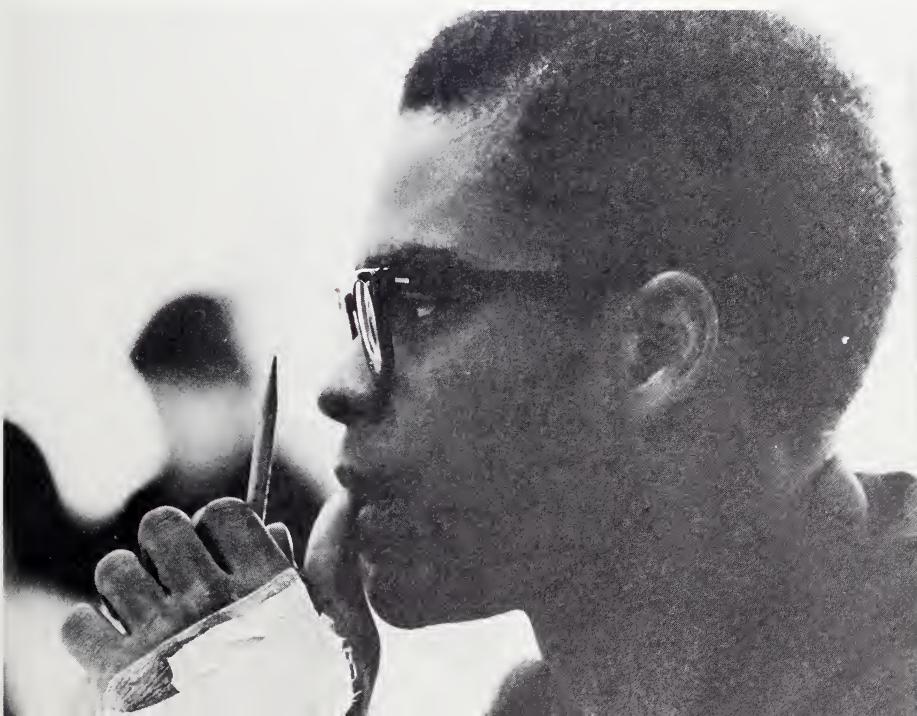
**HE302 Forms of Poetry (3-0-3).** An examination of the variety of techniques by which language is shaped into poetry. The focus is on analytic methods for understanding poetry.

**HE306 Types of Fiction (3-0-3).** Ideas and issues of modern fiction, with particular emphasis on the conventions, techniques, forms, and innovations of the novel and short story.

**HE313 Chaucer and His Age (3-0-3).** The literary and philosophical traditions within which Chaucer



*"...got to realize the sacrifices that you will be making socially. Some girls aren't ready for it."*





*"No matter how important a man at sea may consider himself, unless he is fundamentally worthy, the sea will find him out."*

CAPTAIN F. RIESENBERG

and his contemporaries worked. Readings in Chaucer's works, the Gawain poet, and others, including early and late medieval writers from England and the Continent.

**HE314\*\* The Renaissance Mind (3-0-3).** Literature and thought of the period bracketed by the two great English epics. Spenser's *Faerie Queene* and Milton's *Paradise Lost*. The course includes a continental perspective, with readings from such authors as Machiavelli, Rabelais, Cervantes, Montaigne, and Castiglione.

**HE315\*\* Satire and Sensibility in the Age of Reason (3-0-3).** The literature of the "enlightenment" (1660-1780). Reading in the prose and poetry of Dryden, Swift, Pope, Addison and Steele, Johnson and Boswell as well as selected novels and such continental writers as Voltaire.

**HE317 The Romantic Vision (3-0-3).** Concentrates on how writers from 1798 to 1870 responded to the growth of industrialism, religious skepticism, nationalism, and a host of other problems associated with modern life. Readings in representatives of the Romantic and Victorian periods. Reading in such continental writers as Goethe and Novalis may be included.

**HE318 Modern British Literature (3-0-3).** The literature of Great Britain and Ireland of the past hundred years. The novels of Hardy, Conrad, Joyce, Lawrence, Golding, and Lessing; the plays of Shaw, Synge, O'Casey, and Pinter; the poetry of Yeats, Eliot, Auden, and Dylan Thomas.

**HE326 Literature of the American Dream, 1620-1860 (3-0-3).** A survey of American literature from the time of the Pilgrims to the outbreak of the Civil War. Emphasis is on the relationship between the emerging culture and literature.

**HE328 America's Literary Coming of Age (1860-1920) (3-0-3).** A study of American Literature from the Civil War to the development of the United States as a major industrial and military political power after World War I. Focus of the course is the American writer's response to his own culture and to that of his broadening world.

**HE329 Modern American Literature: The 20th Century Challenge (3-0-3).** A study of American literature from 1920 to the present with emphasis on the writers interpretation of the complexities of 20th-century life.

**HE333 Shakespeare and his Contemporaries (3-0-3).** A study of Elizabethan and Jacobean ideas and attitudes through the investigation of a representative sample of Shakespeare's tragedies, histories, and comedies as well as a few plays by contemporaries of Shakespeare.

**HE343 Creative Writing (3-0-3).** After completing initial problem solving exercises in prose, poetry, and drama, students embark upon an approved workload of their own design. Criticism of students' work is accomplished through classroom

workshops and individual conferences with instructor.

**HE344\*\* Professional Writing (3-0-3).** Designed for students interested in advanced methods of preparing, writing, and presenting articles and reports. After initial study and analysis of the form and style in a wide variety of prose writing and practice in various prose forms, students will design and present independent projects.

#### 400-Level Courses: General Description

The HE460 series allows students and English Department faculty with special expertise to pursue together an intensive study of a restricted literary subject. Emphasis in each course will be upon extensive and intensive reading in a limited body of material, techniques of research, and the development of independent critical judgment. Prerequisites for these courses are 1/C or 2/C standing, and at least one 300 level English course. Selection of students for HE470, Pedagogy in English, is made by the English Department from among First Class English majors.

**HE442 Introduction to Literary Criticism (3-0-3).** The theory and practice of literary criticism. Concentrates on what critical approach can yield to the reader in the way of deeper understanding and satisfaction from the work of art. Offered each spring. Required of all English majors. 1/C standing.

**HE461 Studies in a Literary Period (3-0-3).** In-depth study of a limited period in literary history. For example: "Pope and His Literary Contemporaries," "The Beginnings of Romanticism," "The American Renaissance (1830-1860)," and "The 1920's in American Literature."

**HE462 Studies in a Literary Problem (3-0-3).** Cutting across traditional divisions of nationality, historical period, or genre, the materials of this course will be selected to focus on some timeless problem of literature and the human existence it reflects; for example: "Myth and Symbol in Literature," "Literature and Science," "The Concept of the Hero."

**HE463 Studies in Literary Figures (3-0-3).** Extensive reading in the works, biography, and criticism of major figures of world literature; for example: Milton, Wordsworth, Dickens, Joyce, D. H. Lawrence, Melville, Twain, Faulkner, Dostoevsky, Thomas Mann. No more than three such writers will be considered in any one semester.

**HE467 Studies in a Literary Genre (3-0-3).** Study in a special genre; for example: "The Epic," "The Autobiographical Novel," "Science Fiction," "Imagist Poetry."

**HE470 Pedagogy in English (3-0-3).** Experience in leadership and in techniques of education and training through teaching a section of a 4/C writing tutorial under advisory supervision of a member of the staff of the Department of English. Limited to three 1/C English majors per semester.

# Department of History

## History Major

The major in History concentrates upon the development of the important civilizations, societies, and states of the world. The knowledge of historical evolution that is acquired will contribute significant perspective and maturity to the understanding of the great crises and confrontations of today's world and to a more acute awareness of the institutions and values at issue. The program provides a basic historical background as well as the opportunity for specialized study in the fields of American, European, non-Western, naval, and military history. An undesignated Bachelor of Science degree is awarded.

### Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NN203, NL200, EN200, NS252, NS300,\* NL303, NN302, EN300, ES300, EE311-312, ES400, NL400;

\* Taken during second class summer

Mathematics: Calculus III, Differential Equations;

Science: SP201 and SP202;

Humanities/Social Sciences: HE300\* and two elective courses;

Language: Four-six semesters of a modern language;

Special: none;

Major: HH241, HH262, HH223 or HH224, and seven history electives.

\* Taken during second class summer

\*\* Not offered every year.



*"The study of history lies at the foundation of all sound military conclusions and practice."*

ALFRED THAYER MAHAN

### History Courses

**HH103 Modern Western Civilization Since 1715** (3-0-3). This course surveys Western civilization, focusing upon topical areas such as geography, and economic, social, political, and cultural developments. Within these topic contexts, special emphasis is given to the evolution of military institutions and policies.

**HH104 American Naval Heritage** (3-0-3). Building on the general background provided in the first semester, this course examines the antecedents, origins, and development of the United States Navy within the framework of America's growth as a continental and, eventually, global power. *Prereq: HH103.*

**HH220 A Survey of Black History and Culture** (3-0-3). A survey of the progress of the black American from his origins to the present. The course identifies the stereotyped views of past Negro life and presents an understanding of the Black Experience.

**HH223 (127) History of the Ancient World** (3-0-3). Surveys the foundations of Western civilization in the lands bordering on the Mediterranean. It begins with the Greek city states and continues to the fall of the Roman Empire.

**HH224 (128) History of Medieval and Early Modern Europe** (3-0-3). Surveys the development of Western civilization from the fall of Rome through the Middle Ages and Renaissance and Reformation to the Age of Absolutism. It traces the development of the medieval synthesis, the rise of secular culture, commercial capitalism, and national government.

**HH230 Introduction to Philosophy and Logic** (3-0-3). A survey of Western secular philosophy based on readings in representative philosophers; the basic problems of philosophical inquiry and a variety of solutions to them; principles of logic.

**HH232 Ethics** (3-0-3). A critical examination of systems of values and standards, with a discussion of current moral issues.

**HH241 (211) Survey of American History** (3-0-3). A survey of American history from the discovery to the present, emphasizing the political, diplomatic, social, and economic developments that explain the nation's rise from settlement to superpower.

**HH262 (482) Perspectives on History** (3-0-3). A methodology course in which History majors acquire the basic technical skills required for research and writing in subsequent courses in history and other



*"My parents always told me to get the diploma first, that football should be second. You don't know how long you can play football. The discipline here has helped me a lot. It was the best decision I could have made."*

humanities/social sciences disciplines. *Prereq: History major, 3/C.*

**HH317 History of 19th Century Europe (3-0-3).** A survey of European civilization from Napoleon through Bismarck. Traces social, economic, political, diplomatic, and cultural trends and developments, emphasizing the experience of the great powers.

**HH318 (431) History of 20th Century Europe (3-0-3).** Recent European history, stressing the diplomatic relations of the era and the influence of ideologies of European politics and war.

**HH321 Muscovite and Imperial Russia (3-0-3).** A study of Russian history from the founding of Moscow to 1917, examining the domestic and external forces responsible for shaping the structure of Russian society and culture.

**HH322 Soviet History and Contemporary Problems (3-0-3).** An examination of the Revolution of 1917 and the development of the Soviet Union, emphasizing the institutions and policies adopted to meet domestic and foreign problems.

**HH327 (452) History of Recent Germany and East Central Europe (3-0-3).** An analysis of the impact of Germany and the Soviet Union on East-Central Europe since 1919, and the response within the area to these predominating powers.

**HH328 History of Modern Britain (3-0-3).** Studies British political, social, and economic developments from the Glorious Revolution of 1688 to the present, emphasizing the 19th and 20th centuries.

**HH336 Philosophy of Religion (3-0-3).** A philosophical analysis of the central concepts and problems of the Judeo-Christian tradition. The nature of religion, faith, God, evil, and immortality examined from Plato through the death-of-God theologians. *Prereq: 1/C or 2/C only, or permission of instructor.*

**HH340 Philosophy of Science (3-0-3).** An examination of the impact of science on 20th century society, the values assumed by science, and the nature of scientific discovery and experimentation. *Prereq: 1/C or 2/C only, or permission of instructor.*

**HH345 (422) History of Colonial America (3-0-3).** The origins of American civilization from the Age of Discovery to 1776. Emphasis is placed upon the founding of the colonies and their institutional development.

**HH346 Revolutionary and Early National History (3-0-3).** Traces the revolutionary movement and the subsequent development of the new nation, emphasizing the coming of the revolution, the institutionalization of the revolutionary ideal, and the dual development of nationalism and sectionalism.

**HH347\*\* (424) Civil War and the Emergence of Modern America (3-0-3).** An examination of the political, economic, and social developments from

the beginning of the Civil War to World War I, including the wounding of the nation in a civil war and the reunification that made the United States a great power.

**HH348 (429) History of Recent America (3-0-3).** An examination of the political, social, and economic developments from the Progressive era to the Cold War, including World War I, the Era of Normalcy, the New Deal, and World War II and its aftermath.

**HH353 American Social History (3-0-3).** An examination of American life and culture and the forces that have shaped them, emphasizing mass media, popular entertainment, religious movements, and technological advances.

**HH354 (333) American Diplomatic History (3-0-3).** An examination of American foreign relations from the War for Independence through the Cold War. Particular attention is paid to the policies of presidents and secretaries of state, and to the combination of forces that affected their conduct of the nation's foreign relations.

**HH357 History of American Minorities (3-0-3).** Surveys the experiences and accomplishments of disadvantaged groups in American society from colonial times to the present. While black history and culture will be emphasized, the experiences of other racial minorities, ethnic and religious groups, and women will be covered.

**HH358 American Constitutional and Legal History (3-0-3).** An examination of the American constitutional and legal systems from their pre-colonial background to the present. The course emphasizes the legal system as a product of American society during the particular era under consideration.

**HH361 (351) History of China and Japan (3-0-3).** An analysis of contemporary Asian problems which considers their cultural and institutional origins, their 19th century development under the impact of Western influence, and their culmination in contemporary Asian nationalism.

**HH362 History of the Middle East (3-0-3).** A long range historical approach to the Middle East's role in world affairs and the development of its cultural, political, and military institutions. Emphasis is placed on strategic and diplomatic considerations.

**HH363 (222) History of Latin America (3-0-3).** The impact of Europe in the colonial period, the independence struggle, the rise of national states, and the interplay of world forces upon the shaping of 20th century Latin American life.

**HH366 (344) History of Imperialism and Decolonization (3-0-3).** A survey of the growth and dissolution of European and American overseas empires in the 19th and 20th centuries. Topics covered will include the "scramble for Africa," free trade and spheres of influence, strategic and economic imperialism, the process of decolonization, and the problems of emerging nations.

HH373 Western Martial Heritage (3-0-3). Surveys the evolution of the military art from the ancients through Napoleon, and relates the political and social effects of warfare and military systems on the development of Western civilization.

HH374 (411) War in the Western World: The Age of Total War (3-0-3). Examines the dimensions of warfare since the French Revolution and civil-military relations in a broad social context.

HH376 (210) Western Economic History (3-0-3). A study of the rise of industrialization, the evolution of financial institutions, the expansion of international trade, and changes in labor, agriculture, and transportation in the development of national economic policy, with special emphasis on Europe and the United States from the rise of capitalism to the present day.

HH377 (140) Western Cultural History (3-0-3). An introduction to the major epochs of Western

development in the fine arts, the survey examines the evolution of contemporary painting, sculpture, architecture, and music as well as the individuals and societies that produced them.

HH380 History of Science and Technology (3-0-3). A cross-cultural survey of the history of scientific discoveries and their practical applications from the early natural philosophers to the present, with emphasis on the scientific revolution of the 17th century, the Industrial Revolution, and the information explosion of the 20th century.

HH470 (361) History of Military Thought (3-0-3). A study of warfare and military institutions through the views of the military leaders most influential in formulating and changing them, from ancient times to the present. Prereq: HH373 or HH374 or permission of instructor.

*Correction does much  
but encouragement does  
more. Encouragement  
after censure is as the  
sun after a shower."*

JOHANN GOETHE





## Division of U. S. and International Studies

### Department of Language Studies

#### Department of Economics

#### Department of Political Science

## Department of Language Studies

The Department of Language Studies provides introductory and advanced-level courses in five languages: Chinese, French, German, Russian, and Spanish. A minimum of the first four courses in a given language is required of all humanities and social science majors. Programs for these majors provide the option to take additional courses in the humanities/social science areas or to take advanced language courses.

*"The difference between a moral man and a man of honor is that the latter regrets a discreditable act, even when it has worked and he has not been caught."*

HENRY L. MENCKEN

### French Courses

**FF101 & FF102 Basic French I & II (3-0-3, 3-0-3).** Emphasizes the spoken language.

**FF201 & FF202 Intermediate French I & II (3-0-3, 3-0-3).** Continues development of oral, reading, and writing skills. Includes area and cultural topics. *Prereq: FF102.*

**FF301 & FF302 Advanced French with Civilization Readings I & II (3-0-3, 3-0-3).** Develops fluency in conversation and facility in reading and writing. Topics emphasize main aspects of French civilization. *Prereq: FF202.*

**FF411 Development of French Civilization (3-0-3).** From the origins to World War II. *Prereq: FF302 or approval of department chairman.*

**FF412 Modern France (3-0-3).** Contemporary French society, institutions, and national policies. *Prereq: FF302 or approval of department chairman.*

**FF421 & FF422 Representative Readings in French Literature I & II (3-0-3, 3-0-3).** Analysis and discussion of works of leading writers of various periods. *Prereq: FF302 or approval of department chairman.*

### German Courses

**FG101 & FG102 Basic German I & II (3-0-3, 3-0-3).** Emphasizes the spoken language.

**FG201 & FG202 Intermediate German I & II (3-0-3, 3-0-3).** Continues development of oral, reading, and writing skills. Includes area and cultural topics. *Prereq: FG102.*

**FG310 (301) Introduction to Contemporary West Germany (3-0-3).** An introduction to the geography and political, economic and social systems of the Federal Republic of Germany. In German. Stresses development of advanced German language skills. *Prereq: FG202 or approval of department chairman.*

**FG320 (302) Introduction to German Literature (3-0-3).** An introduction to the reading of German literature. In German. Stresses development of advanced German language skills. *Prereq: FG202 or approval of department chairman.*

**FG411 Development of German Civilization (3-0-3).** From the medieval period to World War II. *Prereq: FG302 or approval of department chairman.*

**FG412 Modern Germany (3-0-3).** Contemporary German society, institutions, and national policies. *Prereq: FG302 or approval of department chairman.*

**FG421 & FG422 Representative Readings in German Literature I & II (3-0-3, 3-0-3).** Analysis and discussion of works of leading writers of various periods. *Prereq: FG302 or approval of department chairman.*

### Chinese Courses

**FC101 & FC102 Basic Chinese I & II (3-0-3, 3-0-3).** Emphasizes the spoken language. Provides introduction to writing system.

**FC201 & FC202 Intermediate Chinese I & II (3-0-3, 3-0-3).** Continues development of oral skills. Includes exercises in character recognition, and reading of graded cultural texts. *Prereq: FC102.*

**FC301 & FC302 Advanced Chinese I & II (3-0-3, 3-0-3).** Further development of audio-lingual skills and competence in reading. Emphasis on Chinese cultural patterns. *Prereq: FC202.*

**FC401 & FC402 Reading and Discussions in Modern Chinese I & II (3-0-3, 3-0-3).** Selected texts on major aspects of Chinese areas, civilization, and culture. *Prereq: FC302.*

### Spanish Courses

**FS101 & FS102 Basic Spanish I & II (3-0-3, 3-0-3).** Emphasizes the spoken language.

**FS201 & FS202 Intermediate Spanish I & II (3-0-3, 3-0-3).** Continues development of oral, reading, and writing skills. Includes area and cultural topics. *Prereq: FS102.*

**FS301 Advanced Spanish With Civilization Readings (3-0-3).** Develops fluency in conversation and facility in reading and writing. Topics emphasize main aspects of Hispanic civilization. *Prereq: FS202.*

**FS304 (302) Advanced Conversational Spanish (3-0-3).** The aim of this course is to perfect the student's ability to express himself orally in Spanish on a variety of contemporary and naval subjects. *Prereq: FS202 or approval of department chairman.*

**FS412 Contemporary Latin American Civilization (3-0-3).** Current social, economic, cultural, and political patterns and problems. *Prereq: FS302 or approval of department chairman.*

**FS413 Spanish Civilization (3-0-3).** Cultural history, contemporary institutions and society. *Prereq: FS302 or approval of department chairman.*

**FS421 & FS422 Representative Readings in Spanish-American Literature I & II (3-0-3, 3-0-3).**

Novels, stories, essays, and plays reflecting the characteristics and civilizations of major South American countries. *Prereq: FS302 or approval of department chairman.*

### Russian Courses

**FR101 & FR102 Basic Russian I & II (3-0-3, 3-0-3).** Emphasizes the spoken language.

**FR201 & FR202 Intermediate Russian I & II (3-0-3, 3-0-3).** Continues development of oral, reading, and writing skills. Includes area and cultural topics. *Prereq: FR102.*

**FR330 (301) Writings from Twentieth Century Russia (1900-1953) (3-0-3).** A study of naval, military, and cultural trends in 20th century Russia. Group assignments and individual reports based on Russian books and periodicals. Conducted in Russian. *Prereq: FR202.*

**FR340 (302) Writings from Post-Stalin Russia (1953- ) (3-0-3).** Readings and discussion of new developments in Russian culture of the post-Stalin era. Conducted in Russian. *Prereq: FR202.*

**FR411 Development of Russian Civilization (3-0-3).** From the 10th century to World War II. *Prereq: FR302 or approval of department chairman.*

**FR412 Modern Russia (3-0-3).** The Soviet Union since World War II; social, cultural, economic patterns; technology; armed forces; national policies. *Prereq: FR302 or approval of department chairman.*

### English Course

**FX101 & FX102 English for Non-Native Speakers (3-0-3, 3-0-3).** Alternative to common plebe year courses HE111 & HE112. *Prereq: approval of department chairman.*



*"You have to want to come here. You can't just come to the Academy because your parents or someone else wants you to."*





# Department of Economics

## Economics Major

The major in Economics is designed to acquaint prospective naval officers with both macro- and micro-economic theory, with quantitative methods in economics, with economic problem-solving in an institutional context, and with international economic relations of the United States. An undesignated Bachelor of Science degree is awarded.

### Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NN203, NL200, EN200, NS252, NS300,\* NL303, NN302, EN300, ES300, EE311-312, ES400, NL400;

Mathematics: Calculus III, Differential Equations;

Science: SP201, SP202;

Humanities/Social Science: HE300\* and one elective course;

Language: Four semesters of a modern language;

Special: none;

Major: FE210, FP110 or FP210 or FP362, FE312, FE331, FE341, FE486 and five elective courses in economics with at least two at the 400-level.

\* Taken during second class summer

\*\* Not offered every year.

*"... economic development takes place when managers work hard and die young. If they have heart attacks at age 50, as in the United States, that is called Free Enterprise. If they are shot periodically, as in the Soviet Union, that is called Planning."*

PROFESSOR CHARLES  
ISSAWI, PRINCETON  
UNIVERSITY

such problems as production, distribution, and growth under the system of free enterprise, mixed capitalism, and detailed planning.

**FE331 Descriptive Economic Statistics (2-2-3).** Introduction to statistical techniques used in financial and economic analysis. Includes computation and interpretation of central tendency, dispersion, skewness, univariate and bivariate distribution, economic index numbers, and time series. *Prereq: FE210.*

**FE341 Microeconomics (3-0-3).** Theories of the economic behavior of consumers and producers, the determination of final good and factor prices, market structures and general economic equilibrium. The application of price theory to business problems and public-policy issues. *Prereq: FE210.*

**FE351 The Economics of Government-Business Relations (3-0-3).** A study of the economic interaction of government and the business community, emphasizing the impact of stabilization policies, industrial organization, market structure, antitrust and regulatory policies. *Prereq: FE210.*

**FE361\*\* Urban Economics (3-0-3).** An economic survey of the problems of cities, with attention to public services, poverty, and racial discrimination. *Prereq: FE210.*

**FE362 The Economics of Technology (3-0-3).** An analysis of productivity growth, characteristics of invention and innovation, determinants of research and development activities of government and busi-

ness; the economic impact of automation, technology assessment, transfer, and forecasting. *Prereq: FE210.*

**FE411 Economics of Developing Nations (3-0-3).** Study of the economic characteristics, problems, and policies of developing nations, covering economic growth patterns in Third World nations, their changing role in the international economic order, and the different economic routes being employed toward economic progress. *Prereq: FE210.*

**FE412 International Trade and Finance (3-0-3).** An introduction to international trade and finance with emphasis on the balance of payments, trade policies and practices, and the functions of international agencies. *Prereq: FE210.*

**FE421 The Economics of Defense Management (3-0-3).** Study of the current Defense Department budget and the budgetary process, the application of economic analysis to Defense decision-making, and the consequences of Defense decisions for the U.S. economy. *Prereq: FE210.*

**FE422 Economics of Labor Relations (3-0-3).** A survey of American labor history, union organization, economics of the labor market, and govern-

ment-labor relationships. Current labor and labor-management problems are stressed. *Prereq: FE210.*

**FE431 Public Finance (3-0-3).** The use, in a market economy, of government expenditures and taxation to change the allocation of resources, to modify the distribution of income, and to pursue the macroeconomic goals of price stability and full employment. Microeconomic theory, Federal tax and budgetary institutions are emphasized. *Prereq: FE210.*

**FE434 Money and Banking (3-0-3).** A consideration of central and commercial banking institutions; an investigation of the demand for money and its role as a focal point for monetary policies designed to obtain full employment, price stability and international monetary equilibrium. *Prereq: FE210.*

**FE445\*\* Econometrics (3-0-3).** Quantification of basic economic theory: multiple regression, correlation, and identification techniques for the construction and testing of economic models, and a study of selected alternative models of particular economic interest. *Prereq: FE210 and Calculus I & II.*

*"Those who cannot remember the past are condemned to repeat it."*

GEORGE SANTAYANA





# Department of Political Science

## Political Science Major

The major in Political Science is designed to acquaint prospective naval officers with both the theory and practice of the basic elements of governmental systems. The wide range of courses available in this discipline allows concentration on either basic American or international political systems. The program includes a requirement of four semesters of a modern language with an option to take two additional semesters as electives within the major. The sequence of courses provides an understanding of the dynamics of various political systems and analyzes governmental processes, relationships, and problems in today's world. An undesignated Bachelor of Science degree is awarded.

### Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NN203, NL200, EN200, NS252, NS300,\* NL303, NN302, EN300, ES300, EE311-312, ES400, NL400;

Mathematics: Calc III, SM212;

Science: SP201, SP202;

Humanities/Social Science: HE300,\* FE210, EP220;

Language: Four semesters of a modern language;

Major: FP210, FP220, FP230, FE210 and six approved political science courses plus one approved history or economics course.

\* Taken during second class summer

\*\* Not offered every year.

*"Where liberty dwells,  
there is my country."*

BENJAMIN FRANKLIN

### Political Science Courses

**FP210 Introduction to International Relations (3-0-3).** Introduction to the various approaches to international relations; the nature of the international political system; foreign policy analysis; the principles, theories, machineries and major problems of international relations.

**FP220 Political Science Methods (3-0-3).** A discussion of the philosophy of science for the political scientist and instruction in research methods with emphasis on quantitative techniques. *Prereq: FPA or FPI major or permission of department chairman.*

**FP230 United States Government and Constitutional Development (3-0-3).** Areas of study include the basic concepts of American democracy, the Constitution and its development, the political process, and the structure and functions of the national government and the factors which influence its operation.

**FP241 Introduction to Political Behavior (3-0-3).** An analytical treatment of political behavior from psychological, sociological and cultural perspectives. Focuses on the formation of attitudes through socialization and personality development.

**FP311\*\* Administration in Government (3-0-3).** A critical analysis of management in the public service with emphasis, through the use of the case method, on actual instances of public administra-

tion in the area of national defense. *Prereq: FP230 or consent of instructor.*

**FP312 Communism: Theory and Practice (3-0-3).** The philosophy of Communism, the Comintern, relations of the Soviet Union with radical parties outside Russia and with European Social Democratic Parties.

**FP313 Science, Technology and International Relations (3-0-3).** The effect of science and technology on both the national and international political systems. The role of the scientist, development and research in national and world decision-making. Special emphasis is given to nuclear non-proliferation, space co-operation, and environmental control.

**FP314 Formulation of U.S. Foreign Policy (3-0-3).** The formulation and execution of the various American foreign policies to include: constitutional roles, the decision-making structure, military input to policy-making, the administration of foreign policy; agencies, procedures and practices. Substantive policy is analyzed in light of decision-theory, ends-means and capability analysis. *Prereq: upper class.*

**FP322 Comparative European Politics (3-0-3).** Using a contemporary and comparative approach, this course focuses on the structures and functions

of the political systems of some of the principal European nations.

**FP323 Comparative Latin-American Politics (3-0-3).** An analytical treatment of the structure and dynamics of independent Latin American political systems, individually and in comparison; parties, interest groups, the military, the church, revolution, foreign policy, and political thought.

**FP324 Latin-American International Politics (3-0-3).** The Inter-American System; patterns of Inter-Latin American and extrahemispheric relations; the Latin American policy of the United States.

**FP325 American Political Theory (3-0-3).** A detailed analysis of the currents of American political theory from the 18th century to the present. Traditional concepts are critically analyzed in world perspective.

**FP326 The American Presidency (3-0-3).** The growth and evolution of the Office of the President, executive agencies; their function, control and problems. Special attention is given to the President's role as Commander-in-Chief, and his relations with the legislative and judicial branches. *Prereq: FP230 or consent of instructor.*

**FP328 The Legislative Process (3-0-3).** A comparative examination of the legislative process at all levels of American government with special emphasis on congressional-military relations. *Prereq: FP230 or consent of instructor.*

**FP355 Civil-Military Relations (3-0-3).** An interdisciplinary approach to the complex nature of civil-military affairs. *Prereq: FP230 or consent of instructor.*

**FP357 Chinese Political and Military Systems (3-0-3).** An examination of Chinese political and military systems from 1927 to the present. Emphasis is placed on economic, political, and foreign policies of the Chinese Communist regime.

**FP365 African Politics (3-0-3).** An introduction to the political trends and constitutional developments of present day African governments; their relations with one another and the rest of the world. Attention is directed to the U.S. security aspects of African national growth.

**FP367 Soviet Political and Military Systems (3-0-3).** The development of the Soviet system of government. Leninism and Stalinism, structure and functions of the central government, Council of Ministers, the Supreme Soviet, Presidium, Central Committee, and Defense Ministry.

**FP368 Comparative Asian Politics (3-0-3).** A systematic comparative approach to the study of Asian governments, their political, economic and military development, regional relationships and problems.

**FP369\*\* Middle Eastern Politics (3-0-3).** A comparative analysis of politics and institutions includ-

ing foreign policy of Middle Eastern nations. The conflict of nations within this system and the world-wide effects are emphasized.

**FP371 Asian International Politics (3-0-3).** An examination of the Asian nations' political relationships with each other and the rest of the world with special emphasis on U.S.-Asian relations.

**FP372 Political Parties and Pressure Groups (3-0-3).** A study of the dynamics of group politics in the American system of government. Emphasizes the roles played by parties, interest groups, public opinion, and elections in the American political process. *Prereq: FP230 or consent of instructor.*

**FP394 Political Theory (3-0-3).** A study of political philosophy, with emphasis on the roots of democracy: the writings of the major writers from Plato to the present.

**FP397 American Judicial Process (3-0-3).** An examination of the judicial process at the federal and state levels including the nature and limits of the law and the key actors: defendant, prosecution, defense, judge, jury, and corrections personnel. *Prereq: FP230 or consent of instructor.*

**FP408 International Law (3-0-3).** A survey of the public law of nations including the law of peace, the law of war, and law of the sea. Problems and case studies are used extensively.

**FP411 Constitutional Law (3-0-3).** A survey of the basic principles of the Constitution, particularly the civil and political rights of the individual, as determined by the Supreme Court. *Prereq: FP230 or consent of instructor.*

**FP412 Perspectives of American Law (3-0-3).** A study of the American system of law, including its role in the political process, the basics of court structure and procedure, torts, crimes, contracts, negotiable instruments, real property, business associations, transfer of property at death, insurance, and agency.

**FP421 National Security Policy (3-0-3).** Stresses the interaction of domestic, foreign and military considerations in the making and execution of national security policy. Case studies and national strategic estimates highlight the course. *Prereq: FP230 or FP210 or consent of instructor.*

**FP437 International Organizations (3-0-3).** A study of the expanding role of international organizations, particularly in the security field, since the end of World War II. Special attention is given to the U.S., to major regional systems, and the U.S. role in multilateral diplomacy. *Prereq: FP210 or consent of instructor.*

**FP438 Comparative Government and Politics of Developing Areas (3-0-3).** Governmental and political problems, institutions and behavior in developing areas. Political thought, impact of change, leadership and organization in Africa, Asia, and Latin America.



*"It's definitely a way for blacks to get ahead, but you have to be prepared to sacrifice the 'good life' for awhile in order to attain your goals."*



## Division of Professional Development

Department of Leadership and Law  
Department of Seamanship and Navigation

### Department of Leadership and Law

#### Leadership and Law Courses

Three leadership courses and one law course are required of all midshipman regardless of major:

**NL102 Leadership I: Fundamentals of Naval Leadership** (2-0-2). An introductory course to instill in midshipmen a professional sense of purpose and personal honor, as well as those significant military leadership traits and techniques which will insure credibility in the communication of their ideas and commands, and give them an appreciation for individual and organizational factors which influence their performance as leaders.

**NL200 Military Psychology** (3-0-3). A study of theory and principles of individual and group be-

havior and their relationships to effective leadership in the naval service.

**NL303 Leadership II: Application** (3-0-3). A culminating course to reinforce the practical aspects of leadership in the naval service, utilizing the case study process to aid midshipmen in formulating their own style of leadership.

**NL400 Law for the Junior Officer** (2-0-2). An investigation of the aspects of military justice and the law of war relevant to the junior naval officer.

In addition, the following course is required for midshipmen who are to be commissioned in the Marine Corps:

**NL454 The Junior Marine Corps Officer** (1-2-2). A culminating course of professional instruction covering those duties and responsibilities normally

encountered by a Company Grade officer ashore and afloat. *Prereq: 1/C standing.*

### Department of Seamanship and Navigation

#### Seamanship and Navigation Courses

All midshipmen, regardless of major, must complete the following courses:

**NS101 Fundamentals of Naval Science** (2-2-3). Introduction to the basic concepts of seamanship and shiphandling including laboratories on YPs, MSLs, an outdoor damage control trainer, and an indoor seamanship trainer. Instruction includes operational and administrative organization, communications, damage control, and basic weapons systems.

**NN203 Navigation I** (2-2-3). Terrestrial navigation including piloting and navigation systems for

surface navigation, basic meteorology and Inland Rules of the Nautical Road, and practical exercises and YP drills afloat. *Prereq: NS101.*

**NS252 Shiphandling and Tactics** (1-2-2). A course of professional instruction covering the art and science of shiphandling, radar piloting, tactics, special seamanship and operational evolutions with emphasis on the development of midshipmen as capable mariners. *Prereq: NS101, 3/C cruise.*

*"Without a decisive  
Naval force we can do  
nothing definitive. And  
with it, everything  
honorable and glorious."*

GEORGE WASHINGTON

**NS300 Operations and Tactics (2-2-3).** Introduction to small craft operations taken during second class summer. Emphasis on practical instruction highlighted by a five-day underway exercise in YPs with midshipmen performing all shipboard duties. *Prereq: NS101, NS252.*

**NN302 Navigation II (2-2-3).** Celestial navigation including electronic navigation and further instruction in International Rules of the Road; and practical exercises and YP drills afloat. *Prereq: NN203.*

The following course is offered as an elective:

**NN412 Air Navigation Systems and Air Traffic Control (3-0-3).** An advanced study and application of air navigation, including electronic, celestial and airways navigation methods and procedures. *Prereq: NN302.*



## Academy-Wide Seminars and Research Projects

Academic departments may offer seminars and individual research projects to upper classmen on the following basis:

### Seminars:

|                   |                       |
|-------------------|-----------------------|
| XX 481 and XX 482 | 1-0-1                 |
| XX 485 and XX 486 | 3-0-3 Advanced topics |

### Research Projects:

A creative project in the student's field of interest. A faculty advisor must approve and monitor each project.

Prerequisite: approval of department chairman.

|                   |       |
|-------------------|-------|
| XX 491 and XX 492 | 0-2-1 |
| XX 493 and XX 494 | 0-4-2 |
| XX 495 and XX 496 | 0-6-3 |

Note: XX represents the departmental designator.

*"I haven't had any trouble with the professional courses. I guess it's because I feel they are the most important of all the courses that we have here."*



# VIII

## Professional Training Courses

The overall program at the Naval Academy is designed to provide midshipmen with a broad academic and professional foundation upon which they will be able to build competence in any of the warfare specialties they may elect to follow at graduation: surface warfare, aviation, the submarine service, or the Marine Corps. The development of a strong sense of commitment to the naval service and the fostering of high personal standards are major aims of our program.

Professional development of midshipmen is the overall responsibility of the Commandant of Midshipmen. This development starts on the very first day of plebe summer and continues through graduation four years later. It consists of professionally oriented classroom studies (in all, 16 courses during the four years) and of drills and practical training conducted at the Academy during the academic year, as well as of professional training conducted during the summer at shore bases and at sea with units of the fleet. Included are instruction and training in navigation, seamanship and tactics, naval engineering, naval weapons, leadership, and military law.

Each midshipman's professional development is monitored and graded throughout the years at Annapolis. These grades are considered along with grades achieved for academic studies in other (non-professional) areas of the curriculum in determining a midshipman's class standing at graduation.

A summary of the Naval Academy's program for the professional development of midshipmen follows:

### Fourth Class Summer

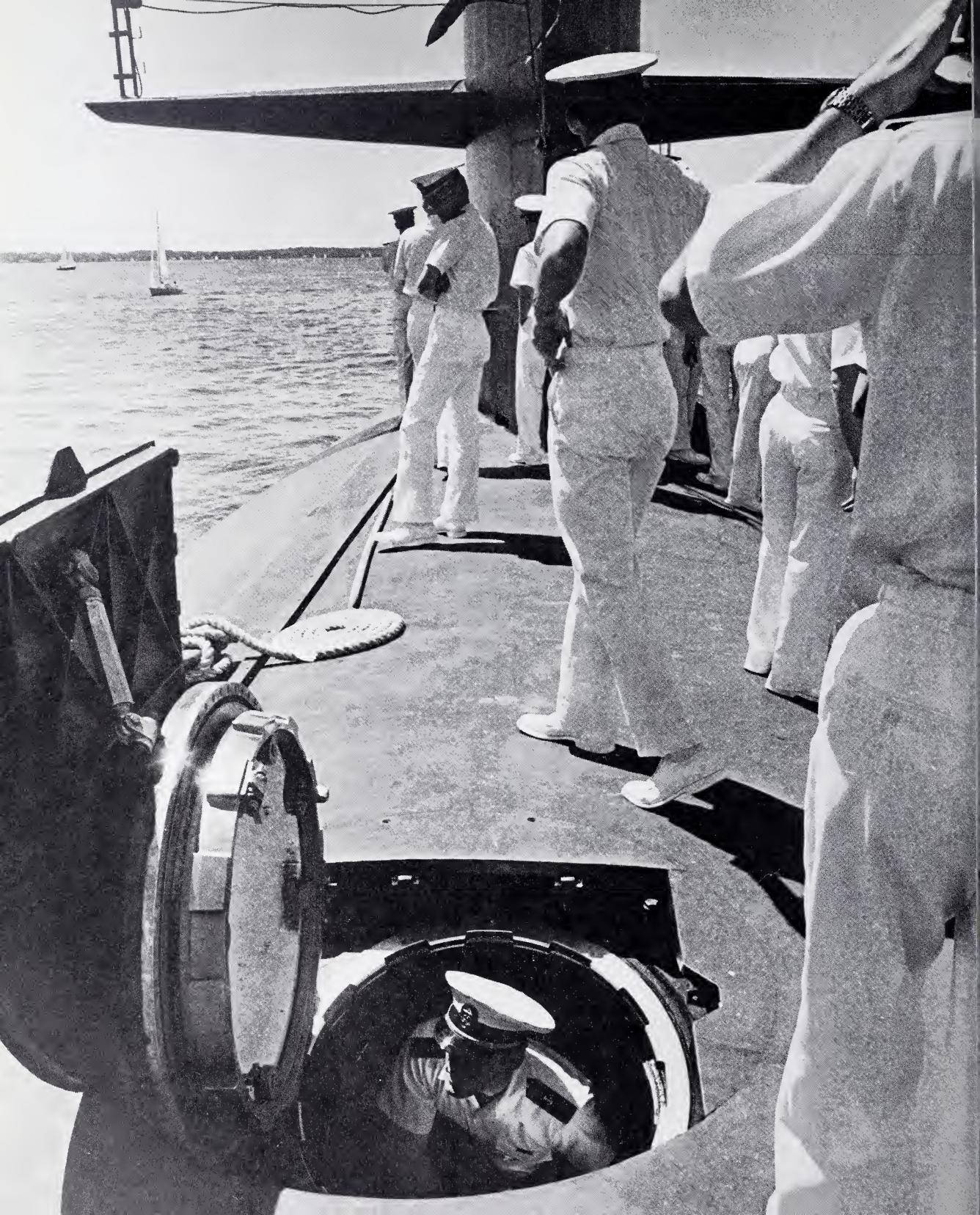
**Introduction to Seamanship.** Practical instruction in elementary seamanship, sailing in small sloops and yawls, powerboat handling, rules of the nautical road, and visual signalling.

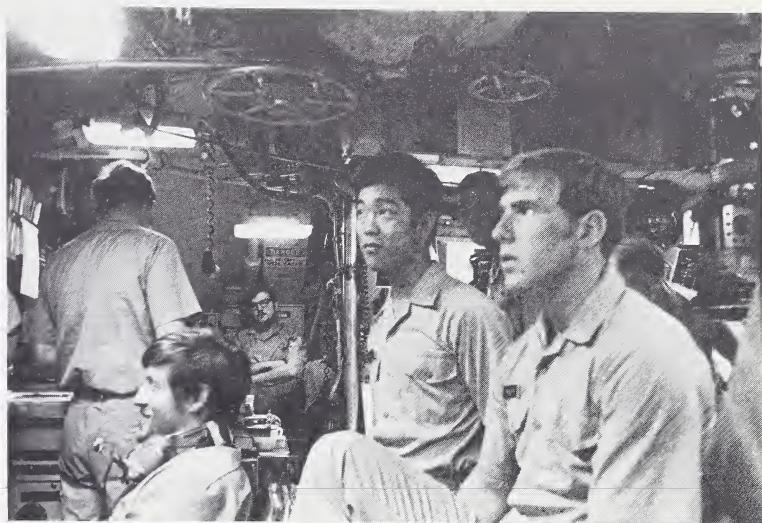
**Physical Education Orientation and Indoctrination.** Preliminary examinations in swimming, posture, and athletic ability. Physical education drills in fundamentals of swimming, boxing, wrestling, hand-to-hand skills, posture, and personal conditioning. Indoctrination

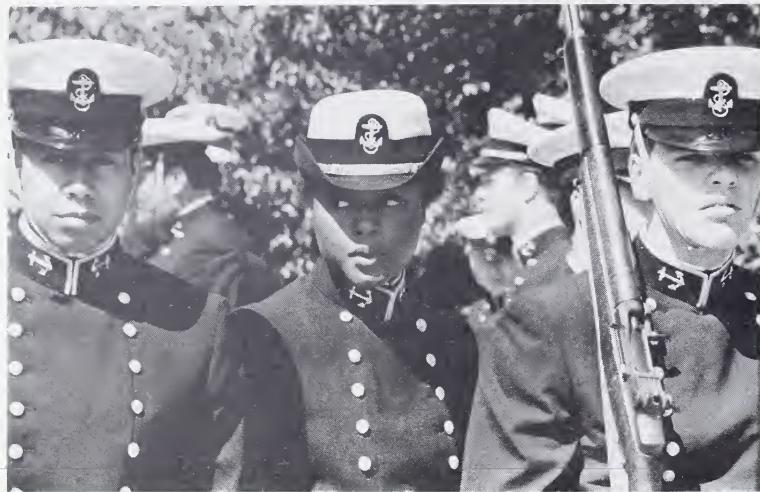


*"The value of tradition to the social body is immense. The veneration for practices or for authority, consecrated by long acceptance, has a reserve of strength which cannot be obtained by any naval device."*

ALFRED THAYER MAHAN







*"A collision at sea can ruin your entire day."*      THUCYDIDES



*"The task of leadership is not to put greatness into humanity, but to elicit it, for the greatness is already there."*

JOHN BUCHAN

drills in lacrosse, fencing, soccer, rugby, gymnastics, crew, golf, tennis, squash racquets, and track.

**Small Arms.** Practical instruction in nomenclature, field stripping and assembly of small arms. Firing of service pistol. Midshipmen who qualify are awarded the Navy Expert Pistol Medal.

**Indoctrination.** The plebe summer indoctrination program is designed to provide a fundamental knowledge of the Naval Academy and the Navy and a thorough indoctrination into plebe responsibilities. The program is fundamental to the smooth transition of each midshipman from civilian life to life as a member of the Brigade of Midshipmen. The strenuous and demanding regimen prepare the plebe for rigors of the four-year program and provides the basis for future development of professional competence, integrity, and physical and mental stamina.

**Fundamentals of Naval Hygiene.** The fundamentals of personal hygiene, including mental and physical hygiene, and first aid.

## Fourth Class Year

**PE101 & 102 Physical Education.** Instruction in the fundamentals of swimming, boxing, wrestling, gymnastics, hand-to-hand skills, soccer, golf, tennis, volleyball, basketball, handball, squash racquets, and personal conditioning. Tests in applied strength, mile run, swimming, boxing, wrestling, gymnastics, and on the obstacle course. (Women midshipmen will participate in hand-to-hand skills in place of boxing and wrestling.)

**Infantry Drill.** Approximately 13 hours of infantry drill during both the fall and spring, four hours of which are devoted to Brigade dress parades.

**Naval Science** Three professional academic courses in the fields of naval engineering, leadership, and naval science are taken during plebe year. These courses lay the groundwork upon which advanced professional studies will be based. Engineering topics include the basic operation, function and components of propulsion systems and auxiliary engineering equipment. Basic shiphandling, watch and battle organization, communications and command and control centers are topics presented in the first of three naval science courses. The initial leadership course is designed to strengthen each midshipman's sense of responsibility, accountability and personal integrity.



### Third Class Summer

**At-Sea Training.** Midshipmen are sent to units of the fleet on both coasts of the United States as well as the Sixth Fleet in the Mediterranean and the Seventh Fleet in the Pacific for summer-at-sea training. Third classmen are introduced to Navy life at sea, to shipboard organization and relationships, and to the leadership opportunities and challenges of a junior officer. Midshipmen active participate in a wide range of shipboard tasks and evolutions under normal and simulated emergency conditions, both at sea and in port. They stand deck and engineering watches, participate in gun and missile evolutions, and become familiar with shipboard equipment. Each midshipman is required to complete a cruise training journal. Successful completion of a comprehensive cruise examination at the completion of the training period is required.

### Third Class Year

**PE201 & 202 Physical Education.** Continuation of instruction in tennis, swimming, boxing, and wrestling. Instruction in the basics of judo. Tests in applied strength, mile run, swimming, boxing, and on the obstacle course. (Women midshipmen participate in judo and fencing in place of boxing.)

**Infantry Drill.** Approximately 13 hours of infantry drill during both the fall and spring, four hours of which are devoted to Brigade dress parades.

**Naval Science.** Four professional academic courses are taken during "youngster year." The first two navigation courses presents an introduction to the art and science of terrestrial and modern electronic navigation. Topics include chart reading, piloting (position plotting), and principles of basic weather phenomena. A naval engineering course offers studies in ship construction and system acquisition, material strength, and ship stability. The second of three leadership courses emphasizes psychology and considers the application of human behavior theory to effective leadership. The second naval science course provides instruction in the art and science of shiphandling, radar piloting, and tactics.

*"The right of commanding is no longer an advantage transmitted by nature, like an inheritance; it is the fruit of labors, the price of courage."*

VOLTAIRE

### Second Class Summer

**Aviation, Submarine, Surface Line, and Marine Corps Orientation.** Broad professional training in aviation, submarines, surface line, and the Marine Corps at bases away from the Naval Academy. In addition, during second class summer, each midshipman completes four weeks of professional academic training at the Naval Academy which includes afloat operations and tactics on yard patrol craft (YP's) and public communications.

### Second Class Year

**PE301 & 302 Physical Education.** Advanced instruction in tennis, swimming, the principles of personal conditioning, officiating, and the principles of hand-to-hand combat. Electives in handball, squash and volleyball. Tests in applied strength, swimming, mile run, and on the obstacle course.

**Infantry Drill.** Approximately 13 hours of infantry drill during both the fall and spring, four hours of which are devoted to Brigade dress parades.

**Naval Science.** The majority of a midshipman's professional academic courses, six courses in all, are taken during second class year. Navigation II is a continuation of the first navigation course with emphasis on celestial plotting, including celestial motion,

development of various coordinate systems, solution of the navigation triangle, and rules of the nautical road. Naval Weapons Systems is taken, a course which includes sensor, tracking, computational, fire control, and delivery systems. Naval Engineering II concentrates on the principles of operation of fossile-fueled steam propulsion and gas turbine plants as well as the basic elements of thermodynamics. Courses in naval electricity and in electronics are also taken. The last of three leadership courses taken at the Academy is designed to enhance each midshipman's knowledge and understanding of responsibility, accountability and authority, management techniques, problem solving applications for organizations, and the processes of decision-making.

## First Class Summer

**At-Sea Training.** During their last summer of at-sea training with the fleet, first class midshipmen undertake the administrative responsibilities and stand the watches of junior officers. They complete extensive practical work in navigation, taking celestial sightings and determining the ship's position. They are required to complete a cruise training journal, summarizing watches and work in engineering, seamanship, navigation, weapons, operations, and in basic fleet tactics. Selected first class midshipmen may (in lieu of training at sea) participate in a Marine Corps cruise with the First Marine Brigade in Hawaii. Here midshipmen learn first-hand what it is like to be an officer of Marines, working with Marines of all ranks in Marine ground units and aviation squadrons.

## First Class Year

**PE401 & 402 Physical Education.** Instruction in advanced swimming, personal conditioning, and athletic administration. Tests in applied strength, running (mile run), swimming, and on the obstacle course. Electives in squash racquets, tennis, golf, handball, volleyball, and personal defense.

**Infantry Drill.** Approximately 13 hours of infantry drill during both the fall and spring, fours hours of which are devoted to Brigade dress parades.

**Naval Science.** The final three of the 16 professional academic courses are taken during first class year. The second weapons course provides each midshipman with the principles employed in weapons systems design, and exposes him to the complexities of modern day weapons system integration. A tactical warfare seminar, the capstone naval science course, provides the midshipmen with a broad perspective of naval warfare and tactical considerations. It also provides the opportunity for in-depth study of areas of special interest in naval warfare. A law course, designed for junior officers, addresses procedural and substantive military law as well as international law and personal responsibilities.

**Professional Competency Review (PCR).** The PCR is a comprehensive examination given at the beginning of first class year which covers all professional studies completed during the first three years at the Naval Academy. The examination determines whether or not each midshipman has attained the requisite level of professional competence for graduation and commissioning. It also provides an opportunity for midshipmen to evaluate their own professional strengths and weaknesses. The PCR provides the administration with meaningful feedback on the professional curriculum (seamanship, navigation, engineering, leadership, weapons, and summer programs) and thus with a measure of how well the Naval Academy is achieving its goals.



*"No sane man is unafraid in battle, but discipline produces in him a form of vicarious courage."*

GENERAL

GEORGE S. PATTON, JR.



## Varsity and Intramural Athletics

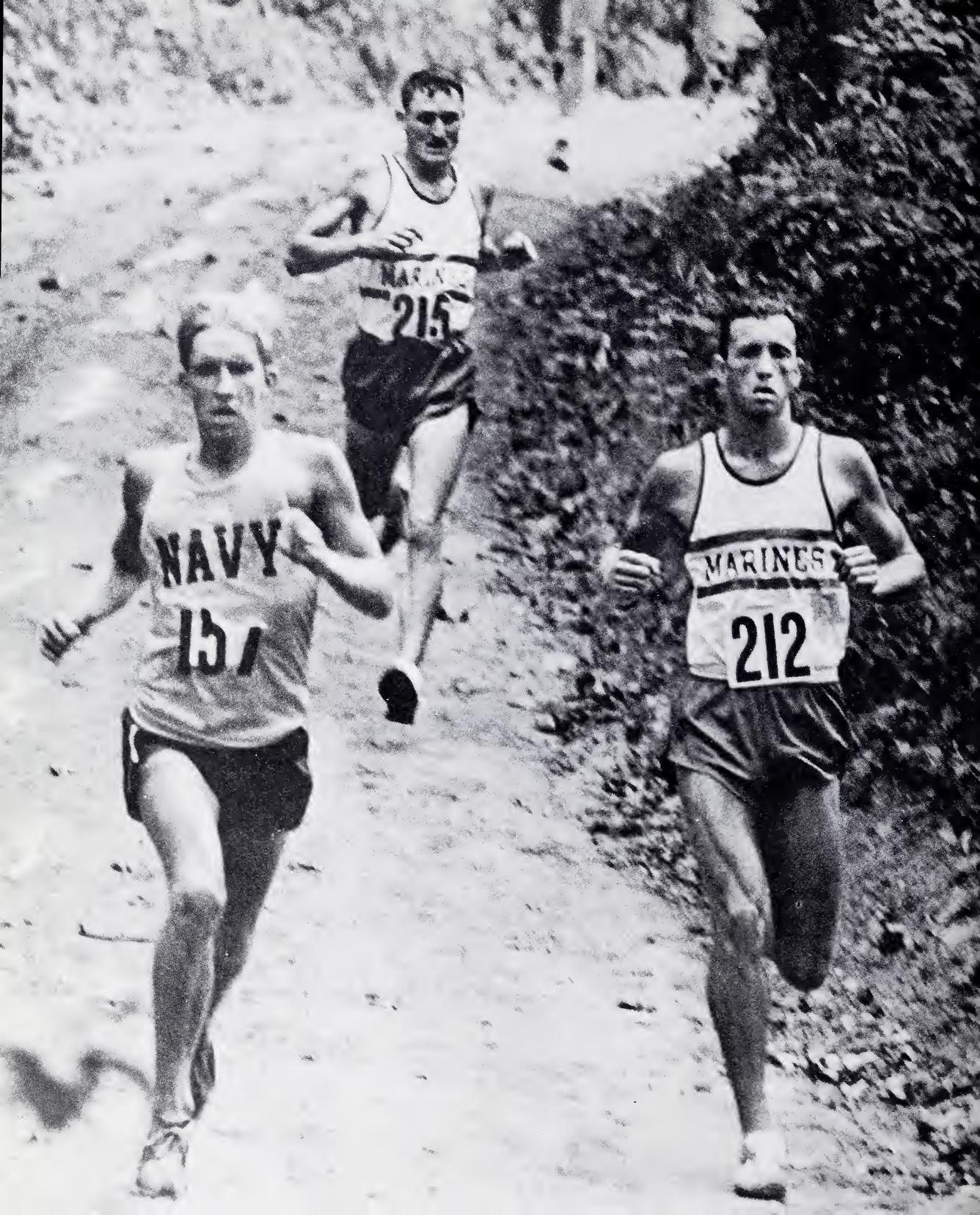
Just as the Naval Academy has a responsibility for the professional and intellectual development of midshipmen, so, also, must it fulfill its responsibility for their physical development. The late John Fitzgerald Kennedy, a World War II naval officer who rose to the highest office in the land, underscored the importance of athletics generally in his thoughts about football: "I sometimes wonder whether those of us who love football fully appreciate its great lesson: that dedication, discipline, and teamwork are necessary. We take it for granted that the players will spare no sacrifice to become alert, strong, and skilled, that they will give their best on the field. This is as it should be, and we must never expect less, but I am extremely anxious that its implications not be lost upon us." When President Gerald Ford visited the Naval Academy in June, 1974 to present the Commander-in-Chief's Trophy to the victorious Navy football team, he was no less emphatic in affirming his deep personal belief in the benefits of athletic competition. A third gentleman, President Jimmy Carter, lettered in two sports as a midshipman—track and cross country.

The exploits of Navy teams in competitive athletics are well-chronicled. Midshipmen have carved an outstanding reputation in 22 sports from football to fencing, sailing to squash, and golf to gymnastics. Two Navy football players—halfback Joe Bellino and quarterback Roger Staubach—won the Heisman Trophy, the college gridiron's most coveted individual prize, within a period of four years. In 1975, roverback Chet Moeller was on everyone's All-America. And, in 1976, middle guard Jeff Sapp received All-American mention.

Navy heavyweight crews captured the Olympic gold medal for eight-oared shells at Antwerp, Belgium in 1920, and in Helsinki, Finland in 1952. And a former Navy oarsman—Alan B. Shepard—was America's first man in space. In the mid-60's the Navy soccer team did not drop a regular season contest over a six-year, 48-game span. And from 1960-67, the Navy lacrosse team reeled off eight consecutive national championships, a feat unparalleled in



*"If you don't have any athletic interest you probably won't be happy here. I've learned to play and really enjoy a lot of sports that I probably wouldn't even have known about at another school."*





*"The battle of Waterloo was won on the playing fields of Eton."*

DUKE OF WELLINGTON





BRIGADE of MIDSHIPMEN



*"The civilian schools asked if I wanted to play (football) for them. I told them no. If I got in, I wanted it to be on my academics. I didn't want to be obligated."*

lacrosse history. They won again in 1970, and were runners-up in 1975. In 1976, a Naval Academy graduate, Captain Lloyd Keaser, USMC, was an Olympic medalist in wrestling.

Through the intercollegiate program, one of the largest in the nation, and an intramural schedule that is equally ambitious, the Naval Academy fulfills its responsibility for the physical development of midshipmen. Academy athletics are big, nationally known and respected, and put a high premium on excellence.

Football at the Naval Academy dates from 1879, just 10 years after Rutgers and Princeton introduced the sport at New Brunswick. The midshipmen have participated in the Sugar, Cotton, and Orange Bowls, and nothing better symbolizes the Naval Academy athletic program than the Army-Navy football game, a sports event in the same galaxy as the World Series, the Kentucky Derby, and the Rose Bowl.

There is enough of a variety in Navy's intercollegiate lineup to satisfy virtually everyone's athletic tastes. In the fall, there is football, cross country, women's volleyball, soccer, 150-pound football, and sailing. Winter is the most active time of year with nine different sports in season—basketball, fencing, gymnastics, pistol, rifle, squash, swimming, track, and wrestling. The spring schedule includes baseball, heavyweight crew, lightweight crew, golf, lacrosse, sailing, tennis, and track.

Women are encouraged to try out for, and participate as competitors along with male midshipmen in all Naval Academy sponsored intercollegiate sports except football, lacrosse, wrestling, and basketball. In 1976-77, women's teams competed for the first time in Naval Academy history at the intercollegiate level in volleyball, fencing, and basketball. The volleyball team was undefeated.

Army traditionally is Navy's top opponent and the service rivals clash in a total of 18 engagements during the athletic year. Annapolis teams also face the perennial collegiate strongboys in every sport—Notre Dame in football, Columbia and New York University in fencing, Lehigh in wrestling, Harvard and Pennsylvania in crew, and Maryland in basketball, to name a few.

But perhaps even more a part of Annapolis life is the competition within the Brigade represented by the intramural sports program. Every midshipman, with the exception of varsity athletes, must take part. Here all can participate, each at a level equal to individual athletic ability. Women are excluded, however, from participating as players in the following battalion-level, contact intramural sports: football, lacrosse, boxing, rugby, and wrestling. Intramural sports include:

|               |                    |                |               |
|---------------|--------------------|----------------|---------------|
| Badminton     | Field Ball         | Softball       | Volleyball    |
| Basketball    | Football           | Squash         | Water polo    |
| Bowling       | Handball           | Swimming       | Weightlifting |
| Boxing        | Knockabout sailing | Team handball  | Wrestling     |
| Crew          | Lacrosse           | Tennis         |               |
| Cross country | Rugby              | Touch football |               |
| Fencing       | Soccer             | Track          |               |

Excellent physical facilities support the program. Navy-Marine Corps Memorial Stadium, seating 28,000 fans between the goal lines, was dedicated in 1959. Halsey Field House is surfaced throughout with Tartan and includes a 220-yard indoor track. There are more than 80 acres of lighted playing fields, an indoor swimming pool, a 5,000-seat baseball park, a challenging 6,217-yard championship golf course, and an impressive array of tennis, squash, handball, and badminton courts. An AstroTurf field provides an all-weather practice area for football, lacrosse, and soccer, and a recently completed indoor skating rink provides for hockey and other skating activities.

The athletic program is administered by the Naval Academy Athletic Association, a non-profit organization with headquarters in Annapolis. The Association arranges the varsity schedules and provides coaching staffs and equipment.



*"Some of my friends went to good schools, MIT, Brown, places like that . . . Others who were good in athletics went to a jock school. I get the best of both here."*



## Extracurricular Activities

Life at the Academy offers midshipmen a wide-ranging choice of over 80 different extracurricular activities (ECAs). All are organized and sustained by the Brigade of Midshipmen themselves. From sky-diving to scuba diving; from an FM radio station, WRNV, to the ham radio club, W3ADO; from the Madrigal Singers to a 150-member chapel choir; from blue water ocean sailing to small day-sailors on the Chesapeake Bay; from hockey to rugby football, midshipmen are involved in exciting pastimes.

In general, extracurricular activities fall into three areas: professional, recreational, and Brigade-support. It is not uncommon for a midshipman to participate in one or two from each group.

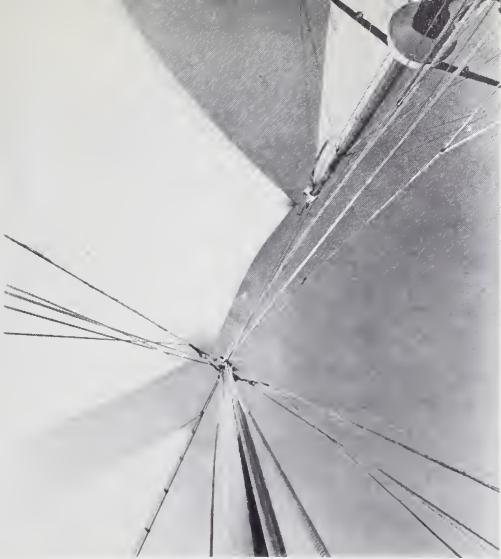
One of the most popular ECAs—professional *and* recreational—is offered through sailing. With one of the finest sailing fleets in the world, over 100 craft in all, midshipmen have the use of an 80-foot schooner, *Mistral*, for coastal and overseas cruising, eight Class "A" ocean racing yachts, twelve 44-foot Luders-designed fiberglass yawls, thirty 24-foot converted Rainbow-class knockabouts, five 30-foot Shields sloops, thirty "420"-class dinghies and 18 Lasers.

Sailing activities include programs of the varsity sailing team and the Midshipman Sailing Club. The sailing team combines competition with professional development by competing in numerous intercollegiate and other regattas. This competition ranges from the single-handed Lasers to the ocean racers with a crew of 14. The Academy sponsors many of these regattas, including the McMillan Cup and the John F. Kennedy Memorial regattas in the yawls. There are dinghy regattas almost every weekend. During the summer, the larger yachts (60-foot sloop *Guerriere*, 58-foot *Syren*, 56-foot *Alliance*, 48-foot *Insurgente*, 39-foot *Fair American*, 38-foot *Patriot*, 38-foot *Firebrand* and 34-foot *Liberty*) are sailed in the open sea in such races as the Trans-Atlantic, Bermuda, Annapolis-Newport, Marblehead-Halifax, and the Chicago-Mackinac race. Midshipmen command and navigate the yachts both in Chesapeake Bay and the Atlantic Ocean.



*"It's really tough being a West Point graduate with an Annapolis daughter, especially when you get these letters that say in big, black letters 'Beat Army'."*







*"I don't think any place compares with the Academy for sailing. The facilities, the coaching, and the competition are outstanding. You can really go somewhere here in sailing."*

peake Bay races, and in ocean races. For the 1976-77 season the Naval Academy won the Fowle Trophy, emblematic of overall intercollegiate sailing supremacy.

The Midshipmen Sailing Club combines recreation and professional development by emphasizing good seamanship in a cruising atmosphere. The highlight of the club's schedule is a summer offshore cruise to such ports as Bermuda and Halifax.

One way or another, with dates or without, thousands of midshipmen engage in sailing during the year. Our encouragement of sailing at the Academy is no accident. Rather, it reflects our long-standing conviction that lessons learned under sail contribute directly to a midshipman's professional development—for the skills and knowledge of seamanship and the sea gained under sail are the same basic skills and knowledge which have been used by

seamen for centuries. They are as relevant in bringing a ship safely home to port today as they ever were. Thus, by developing better seamen, the Academy's sailing program contributes to the development of better naval officers.

The Naval Academy Yard Patrol Squadron, offering another type of professional ECA at the Academy, is organized for midshipmen who desire more extensive training afloat aboard the Academy's yard patrol craft than that offered by the regular curriculum. Similar to sailing, this voluntary activity supplements professional work at the Academy and summer training with the Fleet. The squadron consists of six 80-foot YP craft, one being assigned to each battalion.

The organization and practices of the YP Squadron are very similar to those of Fleet destroyer squadrons on duty around the world. The midshipmen officers are selected for their ability to fulfill command positions. The midshipman selected as squadron commodore is responsible for the overall performance and excellence of the squadron, including the coordination of training, proficiency competition, inspections, and cruises. Midshipmen assisting the commodore include a chief staff officer, two division commanders, and an administration officer. Completing the staff is an engineering officer, who supervises training in engineering and who ensures that engineering equipment is operated and maintained properly. Each yard patrol craft is commanded by a first or second classman who is assisted by a crew of 20, composed of midshipmen from all classes.

Training is serious business during the week. Crews get underway on Tuesday, Thursday, and Friday afternoons. In addition to weekday training sessions, weekend cruises are conducted to Washington, Norfolk, Philadelphia, and to various Chesapeake Bay ports. A Bicentennial cruise was made to New York City and West Point in 1976.

Competition between YPs for the Battle Efficiency Pennant is keen. The crew adjudged most proficient overall in tactics, deck seamanship, piloting, communications, and engineering is declared the winner for the year.

The Scuba Club offers basic scuba diving courses taught by midshipmen instructors, all certified by the YMCA. The club provides tanks and regulators. Students purchase their own skin diving equipment from the club's dive shop at break-even prices. Over 200 divers are trained each year in basic or advanced diving. Once qualified, a member can enjoy club-sponsored trips during weekend liberties or leave periods to the Florida Keys, Virgin Islands, or Bermuda and to the wartime wrecks off the nearby coasts of North Carolina and New Jersey.

The Parachute Club also has its own midshipmen instructors. All are certified by the United States Parachute Association. The club performs



*"I do not care to belong to a club that accepts people like me as members."*

GROUCHO MARX  
(resigning from the  
Friars Club)



*"One thing I really enjoyed here was the extracurricular activities . . . three years with Big Brothers, the last two as chairman . . . raised our membership to over 100 midshipmen."*

demonstration jumps at the Academy during half-time shows, June Week, and during Plebe Summer. Members are afforded an opportunity to qualify for military jump wings during summer leave at the Army's Special Warfare Training Center, Fort Benning, Georgia. There is also a Flying Club, with its own airplane.

The Sportsman Club includes hunting, fishing, camping, hiking, backpacking, cycling, and skeet shooting. Because of the variety of popular activities offered, membership is one of the largest at the Academy.

Our varsity debate teams regularly give an excellent account of themselves as they compete at district and national levels in over 40 intercollegiate tournaments each year. This includes an Academy-sponsored debate tournament in the spring attended by many of the top teams in the country. The History Club sponsors visits by eminent speakers on historical topics and conducts field trips for midshipmen and faculty to points of historical interest. The club newsletter features work of midshipmen.

Professional ECAs at the Academy include a number of nationally recognized academic clubs and societies. Among them are the American Institute of Aeronautics and Astronautics, the Institute of Electrical and Electronics Engineers, the American Society of Mechanical Engineers, the American Society of Nuclear Engineers, Sigma Pi Sigma (the physics Honor Society), the Marine Technology Society and Omicron Delta Epsilon (economics and management). A chapter of the national Semper Fidelis Society provides midshipmen and faculty with an opportunity to share their common interests in the Marine Corps, including its history and traditions. Phi Kappa Phi recognizes superior scholarship in all the major fields of study at the Naval Academy. Each year, up to one percent of the second classmen and five percent of the first classmen are elected to membership by our chapter. Trident Scholars and other graduating first classmen who have distinguished themselves in research while at the Academy may be sponsored by faculty members comprising the local chapter of Sigma Xi for associate membership in the national organization.

The ECAs providing support to the Brigade are wide-ranging and popular. The Glee Club and three choirs involve hundreds of midshipmen. The Drum and Bugle Corps, a company size unit, performs intricate marching routines while playing traditional martial pieces or specially adapted popular tunes. The Trident Brass entertains with contemporary jazz, rock, swing, and stage band music at concerts and dances throughout the year. There are a number of small combos, including rock groups. And the Pep Band, offering a rousing combination of Dixieland, blues and fight songs, leads the Brigade at pep rallies and sporting events.

The Masqueraders, the midshipmen drama and theater group, provide first-rate stage entertainments. The Brigade Hop Committee sponsors dozens of formal and informal dances. And the Juice Gang provides electrical and lighting support for plays and hops (dances).

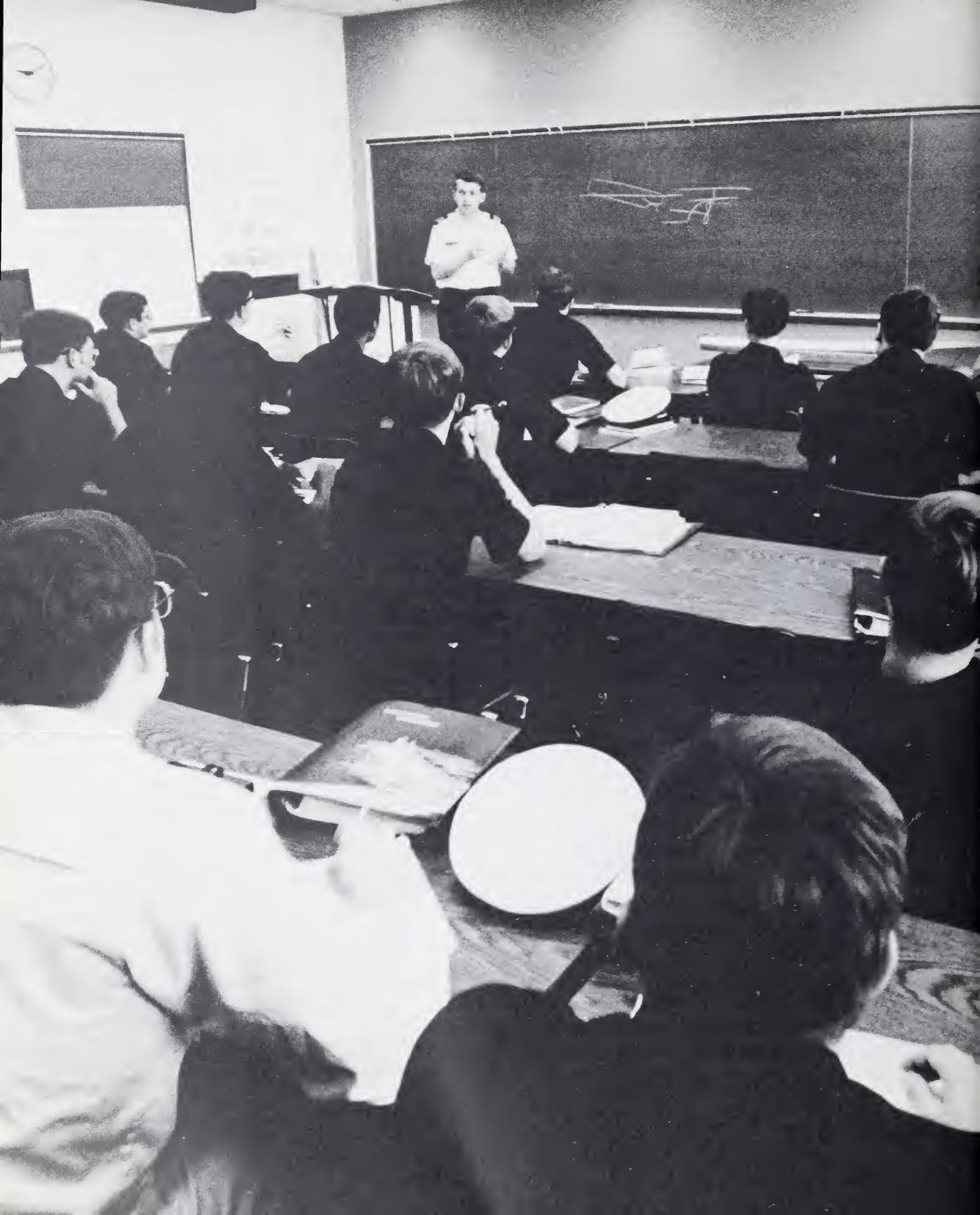
Members of the Brigade publish the *Lucky Bag*, the yearbook for each class; the *Trident Calendar*, a favorite Christmas gift embellished with photographs and cartoons; the *Log*, a literary and professional magazine featuring campus humor; and *Reef Points*, the "Plebe's Bible," a pocket size guide to Academy and Navy customs, lore and traditions (it also serves as a good dictionary for parents and friends to decipher midshipmen letters).

In short, the broad range of extracurriculars offered at the Naval Academy offers something for everyone. For leisure-time entertainment. For professional enrichment. And, it's safe to say, for just plain fun.

*"He that falls in love  
with himself will have  
no rivals."*

BENJAMIN FRANKLIN





## Administration, Staff, and Faculty

The administration of the Naval Academy is in many respects analogous to that of any college. A Board of Visitors performs the broad supervisory functions of a board of trustees. The Superintendent, a flag officer of the Navy, is the equivalent of a college president, and acts as the executive head of the Academy. He is assisted by the Commandant of Midshipmen, whose function is somewhat like that of a dean of students; an Academic Dean; and an administrative staff. The Superintendent, the Commandant, the Academic Dean, and other senior members of the faculty comprise the Academic Board, which makes major academic decisions and sets the academic standards for the Academy. Military, professional, and physical training come under the Commandant. The Academic Dean heads the academic program. Today's 600-man Naval Academy faculty is an integrated group of officers and civilians in approximately equal numbers. The officers, rotated at intervals of about three years, provide a continuing input of new ideas and experience from the Fleet. The civilians provide a core of professional scholarship and teaching experience, as well as continuity to the educational program.



Senator Bumpers

### The Board of Visitors

A Board of Visitors to the Academy, appointed annually, consists of the chairman of the Committee on Armed Services of the U.S. Senate, or his designee; three other members of the Senate designated by the Vice President of the United States or the President *pro tempore* of the Senate, two of whom are members of the Committee on Appropriations of the Senate; the chairman of the Committee on Armed Services of the U. S. House of Representatives, or his designee; four other members of the House of Representatives, two of whom are members of the Committee on Appropriations of the House of Representatives; and six persons designated by the President of the United States.



The Board meets at least once, but usually twice, each year at the Naval Academy to inquire into the state of morale and discipline, the curriculum, instruction, physical equipment, fiscal affairs, academic methods, and related matters, and submits a written report of its action and its views and recommendations to the President of the United States.

### **The Board of Visitors**

#### *Appointed by the President of the United States*

Lieutenant General Victor H. Krulak, USMC (Retired), Chairman, Board of Visitors  
President, Copley News Service

Captain Robert T. Hartmann, USNR (Retired)  
Senior Research Fellow, Hoover Institute of Stanford University

Mr. Donald O. Heumann  
Donald O. Heumann Greenhouses

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Mr. George W. Pepper  
Chairman, Institute for Cancer Research

Mr. Russell A. Rourke  
Administrative Assistant to Representative Harold S. Sawyer, Fifth District of Michigan

*Lieutenant General Krulak*

#### *Appointed by the Vice President*

Senator John H. Chafee, Rhode Island  
Senator Charles McC. Mathias, Jr., Maryland  
Senator James R. Sasser, Tennessee

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Representative Daniel J. Flood, Eleventh District of Pennsylvania  
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Representative Gunn McKay, First District of Utah

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Senator Dale Bumpers, Arkansas  
(Designee of the Chairman, Senate Armed Services Committee)

Representative Goodloe E. Byron, Sixth District of Maryland  
(Designee of the Chairman, House Armed Services Committee)

## The Academic Advisory Board

The Academic Advisory Board was formed by the Secretary of the Navy to advise the Superintendent concerning the Academy's academic program. Meetings are held periodically during the year.

### The Academic Advisory Board

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Vice President for Educational Services  
The Ohio State University

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Commander-in-Chief, Atlantic &  
U.S. Atlantic Fleet & Supreme  
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Professor of Mechanical Engineering and Mechanics  
West Virginia University

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President, Pan American Airlines





Vice Admiral McKee

## Administration

### **Superintendent**

Kinnaird R. McKee, Vice Admiral, USN; B.S., U.S. Naval Academy

### **Commandant of Midshipmen (acting)**

Jack N. Darby, Captain, USN; B.S., University of Colorado

### **Academic Dean**

Bruce M. Davidson; Ph.D., University of Wisconsin

### **Deputy for Operations**

James W. Blanchard, Jr., Captain, USN; M.S.A., The George Washington University

### **Deputy for Management**

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### **Dean of Admissions**

Robert W. McNitt, Rear Admiral, USN (Ret.); M.S., Massachusetts Institute of Technology

### **Director of Athletics**

John O. Coppedge, Captain, USN (Ret.); M.A., The George Washington University

### **Director of Computer Services/Assistant Dean for Educational Resources**

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### **Deputy Equal Employment Opportunity Officer**

R. Eugene Briggs; M.S., Wisconsin State University

## Superintendent's Personal Staff

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William C. Miller, Commander, USN; Ph.D., Stanford University

### **Flag Lieutenant**

Michael A. Stankosky, Major, USMC; M.S., University of Southern California

### **Flag Secretary**

Robert J. Natter, Lieutenant Commander, USN; M.S., Naval Postgraduate School

### **Public Affairs Officer**

James H. Barrett, Commander, USN; M.S., The George Washington University

### **Assistant for Internal Information**

Gordon E. Peterson, Jr., Lieutenant Commander, USN; B.S., U. S. Naval Academy

### **Assistant for Media Relations**

Del Malkie



Dean Davidson

## Deputy for Operations

### **Deputy for Operations**

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Maynard C. Jones

**Security Officer**  
Aimo W. Hill, Jr., Commander, USN; M.S., The George Washington University

**Communications Officer**  
Mickey D. Sullivan, CWO, USN

**Staff Judge Advocate**  
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**Assistant Staff Judge Advocate**  
William P. Bowers, Lieutenant, USNR; J.D., Southern Methodist University

**Visitor Services Officer**  
Cynthia A. Madey, Lieutenant, USN; B.S., University of Tennessee

**Director, Naval Academy Museum**  
William W. Jeffries, Professor; Ph.D., Vanderbilt University

**Senior Chaplain**  
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Robert W. Bedingfield, Commander, CHC, USN; B.D., New Brunswick Theological Seminary

Frederick J. Murray, Commander, CHC, USN; A.B. Phil., St. John's Seminary

Albert P. Connelly, III, Lieutenant Commander, CHC, USN; Th.M., Duke Divinity School

H. Thomas Hiers, Jr., Lieutenant Commander, CHC, USN; Th.M., New Orleans Baptist Theological Seminary

James C. Williams, Lieutenant Commander, CHC, USN; B.D., Benedict College

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William W. Bennett, Captain, SC, USN; B.S., U.S. Naval Academy

**Public Works Officer**  
John J. Shanley, Jr., Captain, CEC, USN; M.S., Naval Postgraduate School

**Manager, Officers' and Faculty Club**  
William E. Hundley; B.S., University of Colorado

**Director of Civilian Personnel**  
Mr. Judson F. Black



*Chaplain Williams*



*Captain Bennett*

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**Deputy for Management**  
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**Comptroller**  
Thomas R. Weissinger, Commander, SC, USN; B.S., U. S. Naval Academy

**Deputy Comptroller**  
John L. Wilson; M.B.A., Middle Tennessee State University

**Management Planning and Control Officer**  
William W. Broadaway, Captain, USMC; M.S., American University



Lieutenant Reichert

### Systems Management Officer

Robert L. Heustis, Lieutenant Commander, USN; M.S., Naval Postgraduate School

## Computer Services

### Director of Computer Services/Assistant Dean for Educational Resources

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### Plans and Projects Officer

Mark N. Friedenberg, Lieutenant, USNR; M.S., University of Southern California

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### Associate Director for Operations

F. Douglas Meyer, Lieutenant Commander, USN; M.S., Naval Postgraduate School

### Associate Director for Educational Development

Richard A. Pollak; Ph.D., University of Pittsburgh

### Associate Director for Computer System

James A. Harle; M.S., University of Maryland

### Director, Data Processing Division

John M. Jones; M.S., Naval Postgraduate School

## Naval Academy Museum

### Director

William W. Jeffries, Professor; Ph.D., Vanderbilt University

### Curator

James W. Cheevers; B.A., William and Mary

## Dean of Admissions

### Dean of Admissions

Robert W. McNitt, Rear Admiral, USN (Ret.); M.S., Massachusetts Institute of Technology

### Admissions Officer

Wilbur H. McNew, Jr.

### Registrar

Edward T. Heise, Professor; M.A., The Johns Hopkins University

### Assistant Registrar

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### Scheduling Officer

Donald S. Gane; M.B.A., University of Michigan

### Statistical Evaluation Officer

Gene E. Hillman; M.S., University of Pennsylvania

### Publications Officer

Edward P. Wilson, Jr.; B.S., U. S. Naval Academy



Professor Heise

## Candidate Guidance

### Director

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### Head, Nominations and Appointments

Jerry H. Black, Commander, USN; M.S., Naval Postgraduate School

### Assistant Director for Candidate Guidance

Henry C. Giffin III, Lieutenant Commander, USN; M.S., The George Washington University

### Regional Director, South Central Area

Jon R. Jensen, Lieutenant, USN; B.S., U. S. Naval Academy

### Regional Director, New England Area

Robert Tamburini, Lieutenant, USN; B.S., U. S. Naval Academy

### Regional Director, Southeastern Area

Peter A. Wick, Lieutenant, USN; B.S., U. S. Naval Academy

### Regional Director, Mideast Area

Peter P. Schneider, Lieutenant, USN; B.S., U. S. Naval Academy

### Regional Director, North Central Area

L. Warren Smith, Captain, USMC; B.S., U. S. Naval Academy

### Regional Director, Central Area

Paulette Reichert, Lieutenant, USN; M.S., Naval Postgraduate School

### Assistants for Minority Affairs

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Joe R. Coffer, Lieutenant, USN; B.S., McMurry College

Johnaa P. Ritchey, Lieutenant, USN; B.A., San Diego State University

### Special Programs Coordinator

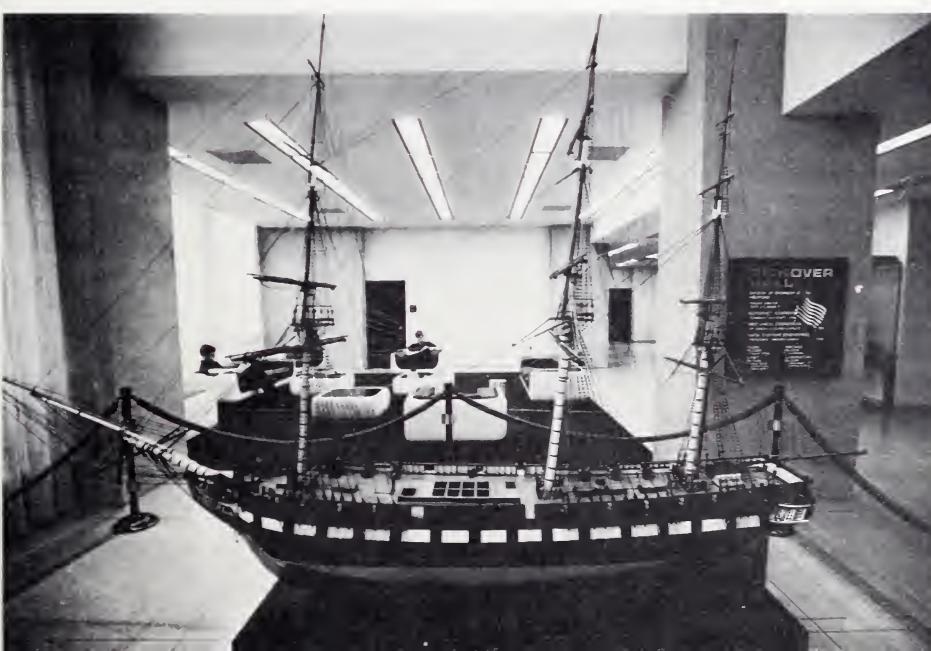
Kevin M. Kennedy, Captain, USMC; B.A., West Chester State College

### Regional Director, Western Area

Thomas E. Teshara



*Dean McNitt*





*Captain Darby*



*Lieutenant Commander Fitzgerald*

## Commandant of Midshipmen

### Commandant (acting)

Jack N. Darby, Captain, USN; B.S., University of Colorado

## Office of the Commandant

### Deputy Commandant

To be assigned

### Executive Assistant to the Commandant

Michael G. Mullen, Lieutenant Commander, USN; B.S., U. S. Naval Academy

### Administrative Officer

James A. Brabham, Major, USMC; B.S., Cornell University

### Performance Officer

James R. Fitzgerald, Lieutenant Commander, USN; M.S., Naval Postgraduate School

### Assistant Performance Officer

Robert W. VanDine, Lieutenant, USN; B.S., U. S. Naval Academy

### Personnel Officer

Charles R. Hammock, Jr., Lieutenant, USN; B.S., University of Albuquerque

### Operations Officer

Edward E. Luetschwager, Commander, USN; B.S., Naval Postgraduate School

### Movement Officer

Michael C. West, Lieutenant, USN; B.A., University of Pennsylvania

### Midshipmen Activities Officer

Robert A. Weeks, Lieutenant Commander, USN; B.S., U. S. Naval Academy

### Midshipmen Recreation Facilities Officer

John D. Maynard, Lieutenant (j.g.), USN; B.A., Western Michigan University

### Scheduling Officer

Carol A. Harrington, Lieutenant, USN; B.A., Barry College

### Band Leader

John R. Bledsoe, Lieutenant, USN

### Assistant Band Leader

Kenneth D. Woodring, Chief Warrant Officer, USN

### Director, Musical Activities

John B. Talley; M.Mus., Peabody Institute

### Assistant Director Musical Activities

James A. Dale, Musician First Class, USN; B.S.Mus., Mansfield State College

### Social Director

Mrs. James G. Marshall

### Social Specialist

Mrs. Reaves H. Baysinger, Jr.; B.S., Wisconsin State University

### First Lieutenant

William P. Tornatore, Lieutenant, USN; B.S.E.E., University of Nebraska

## Brigade Officers

Anthony P. Armbrister, Captain, USMC; B.S., Florida A&M University  
Larry E. Barringer, Commander, USN; B.S., U. S. Naval Academy  
Randy T. R. Bogle, Lieutenant, USN; B.S., U. S. Naval Academy  
Daniel B. Branch, Commander, USN; B.S., U. S. Naval Academy  
Roland Brandquist, Commander, USN; B.S., U. S. Naval Academy  
Glenn R. Brindel, Lieutenant Commander, USN; B.S., Pennsylvania State University  
James M. Brown, Lieutenant, USN; B.S., U. S. Naval Academy  
Royce L. Caplinger, Lieutenant Commander, USN; B.S., Naval Postgraduate School  
Robert A. Capra, Lieutenant, USN; B.S., U. S. Naval Academy  
James C. Carroll, Lieutenant, USN; B.S., U. S. Naval Academy  
Eugene T. Dailey, Lieutenant, USN; B.S., U. S. Naval Academy  
Kurt M. Dieterle, Captain, USMC; B.S., U. S. Naval Academy  
Donald K. Drumm, Lieutenant, USN; B.S., U. S. Naval Academy  
Billy W. Dunlap, Lieutenant, USN; B.A., Adams State College  
Brian D. Finegold, Lieutenant, USN; B.S., U. S. Naval Academy  
James M. Garman, Lieutenant, USN; B.S., U. S. Naval Academy  
Michael J. Havrilla, Captain, USMC; B.S.E.E., University of Southern California  
Lawrence Heyworth, Lieutenant, USN; B.S., U. S. Naval Academy  
John E. Hilburn, Lieutenant, USN; B.S., U. S. Naval Academy  
Gordon S. Holder, Lieutenant, USN; B.M.E., Florida State University  
Melvin Kaahanui, Lieutenant, USN; B.S., U. S. Naval Academy  
James A. Kenney, Commander, USN; M.S., George Washington University  
Guy R. Knieriem, Lieutenant, USN; B.S.E.E., U. S. Naval Academy  
Thomas L. Mendenhall, Lieutenant, USN; B.S., U. S. Naval Academy  
Arlington R. Miller, Lieutenant, USN; B.S., U. S. Naval Academy  
Michael E. Moffat, Lieutenant Commander, USN; B.S., University of Arizona  
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*Coach Markos*





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### Prizes and Awards

Each June Week more than 80 prizes and awards, provided by individuals and a wide variety of organizations, are presented to deserving midshipmen in recognition of their noteworthy accomplishments in such areas as academics, leadership, professional studies, debate, public speaking, sailing, marksmanship, and athletics.

### The Museum

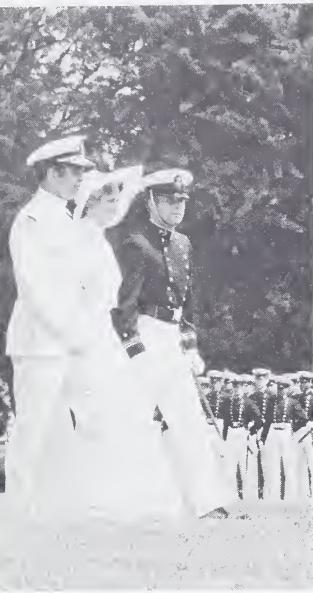
The Naval Academy Museum serves as an inspiration to the midshipmen of the Brigade by providing tangible evidence of some of the most famous and exciting episodes in our nation's history. Its collection of more than 50,000 individual items offers a unique educational opportunity to the midshipmen, generally, while providing both faculty and midshipmen with a valuable and convenient reference source for the study of naval history.

While most of the museum's valuable collections are located within the museum, other items of exceptional interest and value are located in the chapel, Bancroft Hall, Rickover Hall, and in other buildings throughout the Academy. The museum contains some of the finest ship models in the world, including the famous Henry Huddleston Rogers Collection; a superb collection of 13 historical marine paintings by Edward Moran; the Beverley R. Robinson Collection of naval battle prints; an outstanding collection of items relating to the life of John Paul Jones; the table from the mess deck of the battleship *Missouri* on which was signed the instrument of surrender ending World War II; valuable collections of manuscripts and extensive photographic files; and thousands of other significant items relating to the history of the Navy, the Marine Corps, and the Naval Academy. Included are collections of personal items of Decatur, Farragut, Dewey, Sims, Halsey, and other renowned American naval leaders. Museum items in Bancroft Hall include the flag



*"They that give up  
essential liberty to  
obtain a little  
temporary safety  
deserve neither safety  
nor liberty."*

BENJAMIN FRANKLIN



*"If I had to do it all over again, I would."*

hoisted by Commodore Oliver Hazard Perry at the Battle of Lake Erie on which were emblazoned the immortal words of the dying James Lawrence, "Don't Give Up The Ship!"

## The U.S. Naval Academy Alumni Association

The U. S. Naval Academy Alumni Association, Inc., is a private organization whose mission is to serve and support the United States, the naval service, and the Naval Academy by furthering the high standards of the Naval Academy; by seeking out, informing, encouraging, and assisting qualified young men and women to enter the Naval Academy and to pursue careers in the regular Navy and Marine Corps; and by initiating and sponsoring activities which perpetuate the history, traditions, and growth of the Naval Academy and which bind its alumni together in support of the highest ideals of command, citizenship, and government.

All former midshipmen of the Naval Academy are eligible for membership in the Association. Associate membership is available to a limited number of persons who have demonstrated their interest in and support of the Navy, the Naval Academy, or the Alumni Association.

National headquarters of the more than 20,000-member association is located in Alumni House, just a block outside the Academy's gate. Constructed in 1739, and originally named Ogle Hall, it has served as the home of three Maryland governors. Alumni House has been beautifully restored and furnished by members of the Association. Files and records are maintained there on all who have taken the oath of office as midshipmen at the Naval Academy since its founding in 1845.

In addition to serving its members through such activities as publication of an annual *Register of Alumni*, publication of the monthly alumni magazine, *Shipmate*, support of class and chapter organizations, and the offering of group life insurance, medical, and investment programs, the Alumni Association serves as a major source of private funds for the many needs of the Academy and the Brigade which cannot be met by federal funding. The Alumni Association is also the designated coordinator for all other organizations supporting the Naval Academy.

## The United States Naval Institute

With headquarters in Annapolis, the U. S. Naval Institute is the professional society of the seagoing services. It is a private, nonprofit association of more than 63,000 members formed in 1873 for "the advancement of professional, literary, and scientific knowledge in the Navy." The membership includes

officers and enlisted personnel from all branches of the military services, distinguished officers of foreign navies and U. S. and foreign citizens interested in events and developments throughout the worldwide maritime community. Members pay annual dues and receive the Institute's monthly professional journal, the *U. S. Naval Institute Proceedings*, and are entitled to purchase Naval Institute books, as well as those of other publishers, at reduced prices.

The Institute's books include texts on professional naval subjects, training guides and manuals, scientific and technical works, and studies in naval history.

*"It seems as if I have been climbing the ladder of success wrong by wrong."*

ADLAI STEVENSON





# Appendix A

## Form Letters

### Requesting a Congressional Nomination

*(Sample letter)*

Honorable \_\_\_\_\_  
House of Representatives  
Washington, D. C. 20515

or Honorable \_\_\_\_\_  
United States Senate  
Washington, D. C. 20510

Dear \_\_\_\_\_

It is my desire to attend the United States Naval Academy. I respectfully request that I be considered as one of your nominees for the class entering in the summer of 197\_\_\_\_.

The following personal data are provided for your information:

Full name \_\_\_\_\_  
*(Print as recorded on birth certificate)*

Name of parents \_\_\_\_\_

Address: (Use ZIP Code and phone number)

Permanent \_\_\_\_\_

Temporary \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

My date of birth: \_\_\_\_\_ Place of birth: \_\_\_\_\_

Social Security number: \_\_\_\_\_

High school attended: \_\_\_\_\_  
*(Name and address)*

Date of high school graduation: \_\_\_\_\_ Sex: \_\_\_\_\_

My approximate standing is \_\_\_\_\_ in a class of \_\_\_\_\_

I have/have not sent a Precandidate Questionnaire (see page 54 of this catalog) to the Naval Academy.

I have requested my high school transcript of work completed to date be forwarded to your office as soon as possible. I have also listed on the reverse side the results of any ACT or College Board test scores that I have taken.

I have been active in high school extracurricular activities as indicated on the reverse side. I should greatly appreciate your consideration of my request for one of your nominations.

Sincerely yours,

*(Signature)*

Notes: Prospective candidates should apply to their U. S. Representative and to both of their Senators.

If you have not already filled one out, a Precandidate Questionnaire should be requested from the Director of Candidate Guidance, U. S. Naval Academy, Annapolis, Maryland 21402 at the same time that your applications for Congressional nominations are submitted.

*How was I supposed  
to know that I'd ever  
wind up this way?"*

## Requesting a Presidential Nomination *(Sample letter. See below and chapter 5 for eligibility.)*

(This application should be submitted after 1 June and before 15 December of the year preceding desired year of entry.)

To: Superintendent, U. S. Naval Academy, ATTN: Candidate Guidance Office, Annapolis, Md. 21402

Dear Sir:

Date \_\_\_\_\_

I request a Presidential nomination to the United States Naval Academy for the class which will enter in the summer of 19\_\_\_\_\_ and submit the following data:

Name: \_\_\_\_\_

*(Give full name as shown on birth certificate, or, if changed, attach copy of court order.)*

Address: *(Use ZIP Code and provide phone number.)*

Permanent \_\_\_\_\_

Temporary \_\_\_\_\_

Phone \_\_\_\_\_

Phone \_\_\_\_\_

Date of birth: \_\_\_\_\_

*(Spell out month)*

Social Security number: \_\_\_\_\_

*(Must be filled in)*

Name & address of high school/college: \_\_\_\_\_

Month/year of graduation: \_\_\_\_\_ Sex: \_\_\_\_\_ Ethnic origin: Black,  
Oriental, Hispanic, native American (American Indian and native Alaskan), Puerto Rican

Congressional District & State: \_\_\_\_\_

Applying to Congressmen (names) \_\_\_\_\_

Highest scores: PSAT V \_\_\_\_\_, M \_\_\_\_\_, SAT V \_\_\_\_\_, M \_\_\_\_\_; ACT V \_\_\_\_\_, M \_\_\_\_\_

Uncorrected vision: Right 20/\_\_\_\_\_, Left 20/\_\_\_\_\_, Corrected R 20/\_\_\_\_\_, L 20/\_\_\_\_\_

If member of military, check box  List rank, serial number, component, branch of service and organizational address on reverse side of this form.

### Information Concerning Parent's Military Service:

Name of parent: \_\_\_\_\_ *(Parent's rank, serial number, component, and branch of service)*

Sincerely yours,  
*(Signature)*

Note: In establishing your eligibility for a Presidential nomination, you should determine which of the following three service-connected categories applies to your parent, and forward the appropriate documents and information to the Naval Academy along with your letter of application for a nomination. A Precandidate Questionnaire is not required if you provide all the information outlined in this sample letter.

- Active duty officer: (Attach statement of service prepared by personnel officer specifying all periods of active duty.)
- Active duty enlisted: (Attach statement prepared by personnel officer specifying all periods of active duty and listing dates of enlistment and dates of expiration of enlistment.)
- Retired or deceased: (Furnish date and copy of retirement order or casualty report. If appropriate, include brief statement concerning the date, place and cause of death or the details of disability together with the Veterans Administration claim number. If eligible, applicant will be given a nomination in the Children of Deceased or Disabled Veterans category.)



*"The Navy of the United States is the right arm of the United States and is emphatically the peacemaker."*

THEODORE ROOSEVELT



# Appendix B

## Special Medical Considerations

*The following special medical examination considerations are set forth in order that candidates, prospective candidates, and their private physicians and dentists may know the basic medical requirements for entrance to the Academy:*

**MEDICAL HISTORY.** The medical history will be compiled with particular care, with elaboration where indicated. Inquiries will be made in detail concerning all illnesses, injuries, and operations which candidates may have had. Failure to fully document these items can result in disappointment should related medical disqualification be determined later. A history of familial diseases will be investigated thoroughly. If the candidate has received medical care which has significantly affected his physical condition, he will be required to submit evidence from attending physicians or from hospital records concerning this medical care. *A candidate who has defects that are remedial, including dental defects, should have them corrected prior to taking the Qualifying Medical Examination.*

### WEIGHT STANDARDS (Men)

| Height*        | 62  | 63  | 64  | 65  | 66  | 67  | 68  | 69  | 70  | 71  | 72  | 73  | 74  | 75  | 76  | 77  | 78  |
|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <b>Weight:</b> |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Minimum        | 103 | 104 | 105 | 106 | 107 | 111 | 115 | 119 | 123 | 127 | 131 | 135 | 139 | 143 | 147 | 151 | 153 |
| Maximum        | 168 | 174 | 179 | 186 | 191 | 197 | 203 | 209 | 215 | 221 | 227 | 233 | 240 | 246 | 253 | 260 | 267 |

### WEIGHT STANDARDS (Women)

| Height*        | 60  | 61  | 62  | 63  | 64  | 65  | 66  | 67  | 68  | 69  | 70  | 71  | 72  | 73  | 74  | 75  | 76  | 77  | 78  |
|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <b>Weight:</b> |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Minimum        | 94  | 96  | 98  | 100 | 102 | 104 | 106 | 109 | 112 | 115 | 118 | 122 | 125 | 128 | 132 | 136 | 139 | 143 | 147 |
| Maximum        | 125 | 127 | 130 | 134 | 138 | 142 | 147 | 151 | 156 | 160 | 165 | 170 | 175 | 180 | 184 | 189 | 195 | 200 | 205 |

\* Waiver for height up to 80 inches may be granted to a limited number of candidates with exceptional scholastic and leadership achievements.

These weight standards are necessarily arbitrary and waivers may be granted in unusual cases. Obesity is disqualifying.

**EYES AND VISION.** Unaided visual acuity of 20/20 in each eye is a basic requirement. However, waivers may be granted to a limited number of candidates with exceptional scholastic and leadership achievements whose eyes are without excessive refractive errors and will correct to 20/20 with prescription lenses. (Technically, in evaluating the degree of refractive error, the strength of the lens required to correct the vision to 20/20 must not be greater than  $\pm 5.50$  diopters in any meridian, there cannot be more than 3 diopters of astigmatism present, and the maximum difference

Nations have passed away and left no traces,  
And history gives the naked cause of it—One single, simple reason in all cases; They fell because their peoples were not fit."

RUDYARD KIPLING

in power between the eyes may not exceed 3.5 diopters.) Candidates who wear spectacles should take them along when they receive their physical examination.

Both eyes must be free from any disfiguring or incapacitating abnormality and from acute or chronic disease. Candidates wearing contact lenses must remove them at least three weeks prior to reporting for medical examination. Normal color perception is required.

**HEART AND VASCULAR SYSTEM:** An electrocardiogram is required of all candidates. The following conditions may be causes for rejection, and they require complete medical evaluation: all organic valvular diseases of the heart, including those improved by surgery; EKG evidence of variations from normal heart beat; and hypertension evidenced by predominant blood pressure reading of 140 mm or more systolic or 90 mm or more diastolic. The following are causes for rejection: varicose veins, if severe or symptomatic; heart rate greater than 100 on repeated examinations; substantiated history of rheumatic fever within the previous two years; recurrent attacks of rheumatic fever or evidence of residual cardiac damage; history of recurring rapid heart beat within the preceding five years (paroxysmal tachycardia).

**EARS AND HEARING:** Auditory acuity of all candidates will be determined. Maximum acceptable hearing loss in decibels is indicated on the following chart:

|                                         | International Standards Organization (ISO)                                                                            |      |      |      |                                        |      |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------|------|------|------|----------------------------------------|------|
| Frequency (hz)                          | 500                                                                                                                   | 1000 | 2000 | 3000 | 4000                                   | 8000 |
|                                         | 512                                                                                                                   | 1024 | 2048 | 2896 | 4096                                   | 8192 |
| Maximum level in decibels in either ear | Average level in these three frequencies not greater than 30 db with no level greater than 35 db in any one frequency |      | 45db | 60db | Recorded for baseline information only |      |

Both ears must be free from any disfiguring or incapacitating abnormality and from acute or chronic disease.

**NARES:** Septal deviation, hypertrophic rhinitis, or other conditions which result in 50 percent or more obstruction of either airway, or which interfere with drainage of a sinus on either side, are causes for rejection.

**SKIN:** Chronic diseases such as severe acne or eczema or unsightly congenital markings are cause for disqualification. Pilonidal sinus, if evidenced by presence of mass or discharging sinus, is cause for rejection.

**SEROLOGIC TESTS:** A serologic test for syphilis is required of all candidates. An active venereal infection, untreated or incompletely treated syphilis, and certain complications and permanent residuals of venereal disease are disqualifying.

**GENITOURINARY SYSTEM:** Persistent or recurrent albuminuria of any type or the persistence of casts in the urine will be cause for rejection. Other causes for rejection in men: marked phimosis or epispadias; pronounced hypospadias; atrophy.



*"Maintain your sense of humor. If you have a goal and are determined and motivated, you will probably do OK. Don't act scatter-brained or typically girlish!"*

deformity, or maldevelopment of both testes; or an undescended testicle of any degree. Bed wetting persisting into late childhood or early adolescence is cause for rejection.

OTHER CAUSES FOR REJECTION IN WOMEN: Bartholinitis; cervicitis; dysmenorrhea, if incapacitating to an appreciable degree; endometriosis; hermaphroditism; menopausal syndrome under certain conditions; menstrual cycle irregularities of certain types; new growths of the internal or external genitalia with certain exceptions; oophoritis; ovarian cysts; pregnancy; salpingitis; urethritis; certain abnormal conditions or diseases of the uterus, vagina, and vulva; major abnormalities and defects of the genitalia.

*"God heals, and the  
doctor takes the fee."*

BENJAMIN FRANKLIN



**NEUROLOGICAL EXAMINATION:** Evidence of degenerative disorders or conditions such as established migraine and persistent motion sickness are causes for rejection.

**ASTHMA:** Asthma or recurrent asthmatic bronchitis by diagnosis or history since the age of 12 are causes for rejection.

**ABDOMINAL WALL EXAMINATION:** Hernia of any type is disqualifying until corrected; history of operation for hernia within past 60 days is disqualifying. Other abnormal diseases and conditions which are not acceptable include stomach or small bowel ulcer or history of same, acute or chronic gall bladder disease, and removal of spleen for reason other than trauma.

**MISCELLANEOUS MEDICAL FINDINGS THAT ARE DISQUALIFYING:** Acute communicable diseases; anemia; abnormal bleeding states; diabetes mellitus or history of diabetes in both parents; persistent sugar in urine regardless of cause; ununited fractures; history of surgery to a major joint within past six months; history of derangement of knee joint not corrected by surgery, or evidence of instability subsequent to surgery; absence or loss of more than one-third of the distal phalanx of either thumb; tuberculosis, active in past five years; hay fever, if severe; nasal polyps; personality disorders; symptomatic immaturity disorders such as stammering or stuttering; arthritis; and herniated nucleus pulposus or history of operation for this condition.

**DENTAL STANDARDS:** A candidate for appointment must have a minimum of eight natural permanent teeth in each arch. All missing teeth causing unsightly spaces or significantly reduced masticatory or incisal efficiency must be replaced by well-designed bridges or partial dentures which are in good condition. Except for minor or questionable carious areas, all required dental treatment must be completed. Candidates undergoing active orthodontic treatment will be temporarily disqualified. Each such applicant will be considered on an individual basis by the Department of Defense Medical Examination Review Board. Disqualifying defects are as follows:

**Lack of satisfactory incisal or masticatory function.**

**Less than eight natural permanent teeth in each arch.**

**Edentulous spaces which are unsightly or which significantly reduce masticatory function.**

**Carious teeth, except minor or questionable carious areas.**

**Infections or chronic diseases of the soft tissue of the oral cavity.**

**Marked malocclusion which requires early or prolonged treatment, involves tissue impingement on either the facial or lingual/palatal gingiva, or in other ways jeopardizes dental health.**

**Unsatisfactory restorations, bridges, or dentures.**

**Severe or extensive apical or periodontal infection.**

**Perforations from the oral cavity into the nasal cavity or maxillary sinus.**

**Tumors or cysts of the oral tissues which require treatment or may require treatment in the foreseeable future.**



*"Don't ask the barber whether you need a haircut."*

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# Appendix C

## Foreign Students

REPUBLIC OF THE PHILIPPINES. On behalf of the President of the United States, the Secretary of the Navy may authorize up to four Filipinos at any one time to receive instruction at the Naval Academy. Applications for these appointments must be addressed through diplomatic channels. The appointments are competitive.

AMERICAN REPUBLICS OTHER THAN THE UNITED STATES. Upon designation by the President of the United States, the Secretary of the Navy may authorize up to 20 persons at any one time from other American nations to receive instruction at the U. S. Naval Academy. Not more than three persons from any one country may receive instruction at the same time. Applications for these appointments must be addressed through appropriate diplomatic channels. The appointments are competitive. Nominations must reach the Superintendent, U. S. Naval Academy, Attn: Candidate Guidance Office, by 1 January of the calendar year in which entering.

*"I'll tell you, I never really appreciated how much I liked the Naval Academy . . . mids are mids, and they're a great bunch of guys."*

Foreign nationals receiving instruction at the Naval Academy receive the same pay, allowances, and emoluments as other midshipmen; are paid from the same appropriations; and except for such modifications as may be determined by the Secretary of the Navy, are subject to the same rules and regulations governing admission, attendance, discipline, resignation, discharge, dismissal, and graduation, as midshipmen at the Naval Academy appointed from the United States. Foreign students are not entitled to appointment to any office or position in the U. S. Navy by reason of their graduation from the Naval Academy. The entrance deposit in the amount of \$300 is required of all foreign students.

### Each foreign candidate must:

- Be an unmarried, bona fide citizen of the nominating country and, unless otherwise approved by the Secretary of the Navy, be not less than 17 and not yet 22 years of age on 1 July of the calendar year of entrance to the Naval Academy.
- Possess medical qualifications as specified in Appendix B of this catalog. After their arrival in the United States, all candidates must undergo a Qualifying Medical Examination at the United States Naval Academy. Foreign candidates are urged to undergo careful preliminary examination by qualified medical personnel who are conversant with the physical requirements set forth in Appendix B of this catalog before leaving their homes for the Naval Academy. Those with obviously disqualifying defects may thus be spared the needless expense of the trip to Annapolis. In case of reasonable doubt as to whether or not the defects are disqualifying, it is recommended that a telegraphic inquiry be addressed to the Superintendent, U. S. Naval Academy, Attn: Director of Candidate Guidance, Annapolis, Maryland, 21402 U.S.A.

Be proficient in reading, writing, and speaking idiomatic English. Candidates may meet scholastic entrance requirements by submitting certificates from schools attended. They must also take either the American College Testing Program (ACT) test or the College Entrance Examination Board Scholastic Aptitude Test (SAT). Due consideration is given to the fact that these tests are prepared in the English language and not in the native tongue of the candidate.

The naval attaché or a diplomatic representative of the United States in the candidate's country must provide a report of the candidate's proficiency in the use of idiomatic English.

Governments should submit the names of candidates as early as possible in order that they may qualify for entrance by the end of April and enter the Naval Academy in July.

In lieu of the oath of allegiance to the United States, a substitute oath will be required, in substance as follows:

I ..... , a citizen of .....  
having been permitted to receive instruction as a midshipman at the United States Naval Academy, do solemnly swear to comply with all regulations for the policy and discipline of the Naval Academy, and to give my utmost efforts to accomplish satisfactorily the required curriculum; do swear not to divulge any information of military value which I may obtain directly or indirectly in consequence of my presence at the United States Naval Academy to any alien government; and do agree that I shall be withdrawn from the United States Naval Academy if deficient in conduct, health, or studies.

Notification will be given to the governments concerned that students found by proper authority to be unsatisfactory in conduct, studies, or health will be accorded the same consideration given to other midshipmen regarding withdrawal from the Academy or repetition of a year's work.



*"I was inside the gate for about 15 minutes that first day when I knew it wasn't going to be easy . . . felt like I was standing still and everything else was going on around me."*



## Appendix D

### Oath of Office and Entrance Day Procedures

Candidates for whom there are vacancies and who have met the scholastic, moral, and physical requirements, will be offered appointments as midshipmen and be admitted to the Naval Academy.

Each candidate for midshipman will be required to take the following oath of office upon entrance:

*"I, . . . . ., having been appointed a midshipman in the United States Navy, do solemnly swear (or affirm) that I will support and defend the Constitution of the United States against all enemies, foreign and domestic; that I will bear the true faith and allegiance to the same; that I will obey the orders of the officers appointed over me; that I take this obligation freely, without any mental reservation or purpose of evasion; and that I will well and faithfully discharge the duties of the office on which I am about to enter; so Help Me God."*

You will take the oath by holding up your right hand and swearing that you voluntarily bind yourself by its terms. You will also sign your name as a record to your oath. This must not be a perfunctory procedure in any sense, and you should consider carefully and understand thoroughly the obligation that will become yours.

Each will also be required to subscribe to the following agreement under oath:

*"For and in consideration of the privileges, opportunities, and benefits afforded me during the continuance of my service as a midshipman, I agree to and with the Superintendent of the United States Naval Academy, as follows:*

*"First: To enter the service of the Navy of the United States and, to the utmost of my power and ability, to be in everything conformable and obedient to the several requirements and lawful commands of the officers who may be placed over me.*

*"Second: I oblige myself, during such service, to comply with and be subject to the Uniform Code of Military Justice and such other laws and regulations as are or shall be established by the Congress of the United States or other competent authority.*

*"Third: To submit to treatment for the prevention of smallpox, typhoid (typhoid prophylaxis), and to such other preventive measures as may be considered necessary by naval authorities."*

Candidates are usually sworn in as midshipmen on the day they are accepted for admission, i.e., the date of reporting to the Naval Academy as designated in the Permit to Report issued by the Superintendent, U. S. Naval Academy. Living accommodations in the city of Annapolis are limited, and candidates are therefore

Plebe year seemed  
tough while going  
through it. But  
looking back it was  
worth it. The summer  
was a blast!"

urged to time their arrivals in Annapolis to coincide as closely as possible with the reporting time and date, keeping in mind, however, that transportation facilities between Washington and Annapolis and between Baltimore and Annapolis are limited.

Midshipmen who are involuntarily separated from the Naval Academy prior to repayment of the entrance credit, are required to turn in all articles of uniform and equipment deemed suitable for reissue, to an amount sufficient to liquidate their indebtedness. If reclaimed articles are insufficient to cover the indebtedness, parents will be given an opportunity to pay the remaining debt; failing this, the remainder of the debt is cancelled. Midshipmen applying for voluntary separation for their own convenience are required to repay in full the amount of indebtedness prior to separation.

Every candidate must present a Social Security card upon reporting for appointment. If an individual has not obtained a Social Security number as a result of work experience prior to entering, one should be obtained based on the length of expected employment as a midshipman.

Upon entrance, midshipmen will be required to obtain a regulation entrance outfit from the midshipmen's storekeeper. Calculators and drawing sets are included in the outfit. Candidates are advised, therefore, not to purchase these items prior to entering the Academy.

After being admitted to the Naval Academy, midshipmen receive travel and transportation allowances as prescribed in Joint Travel Regulations (ordinarily, mileage allowance of 10 cents per mile for authorized travel). Midshipmen will be reimbursed for the actual cost of their fares in commercial ships provided no government transportation was available. In those cases in which travel originates outside the United States, candidates must contact the nearest naval activity for information as to the availability of government transportation before endeavoring to procure commercial transportation. When government transportation is not available, a certified statement to this effect must be presented in order for the candidate to be reimbursed after becoming a midshipman.

Shortly after entrance, each midshipman (except foreign nationals) will be required to complete a statement of personal history. Candidates should be prepared to furnish such information as:

*Names and locations of all schools attended.*

*Family names, dates and places of birth of parents, service data if parents are or were in armed forces; naturalization numbers of parents if applicable.*

*Relatives in foreign countries—relationship and location.*

*Names and addresses of former employers.*

*Names and addresses of three credit and five personal references (credit references may include those of parents).*

*Residences during past 15 years. (Dates, street addresses, and cities are required.)*

Candidates admitted as midshipmen will be required to submit documentary



*"For they had learned that true safety was to be found in long previous training, and not in eloquent exhortations uttered when they were going into action."*

THUCYDIDES



*There are some upper-class I would follow through fire; there are others I feel like pushing in."*

evidence of birth to the Superintendent, U. S. Naval Academy. A certified copy of the public record of birth is the best evidence. Supporting evidence will be required if the name on the evidence of birth is not identical with the name of the candidate. Except for candidates entering the Academy as citizens of certain foreign countries, as provided by law, all candidates born outside the United States must show proof of U. S. citizenship in the form of a Department of State, consular, or other governmental report of birth.

Each qualified candidate, before being admitted as a midshipman must deposit with the Midshipmen Store, U. S. Naval Academy, the sum of \$300, to be used to cover in part the cost of uniforms, clothing, textbooks, etc. The deposit is not refundable. This deposit should be made in the form of a personal check, cashier's check, certified check, traveler's check, etc., made payable to the Midshipmen Store, U. S. Naval Academy. In hardship cases the deposit may be reduced to \$100 by the Registrar.

## Appendix E

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### Naval Academy Information Program

NAVAL ACADEMY INFORMATION OFFICERS, commonly known as Blue and Gold Officers, are Naval Reserve officers located throughout the country who have received specialized training in the Naval Academy admission procedures. These officers are not on active duty but are in contact with officials at Annapolis throughout the year. Anyone interested in receiving counseling assistance from a Blue and Gold Officer may write or call the nearest Naval Academy Information Officer State Coordinator to find out the name and address of your nearest Information Officer.

#### State Coordinators

##### ALABAMA

Captain Alan F. Clark  
1631 Lakewood Drive  
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##### ALASKA

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##### CALIFORNIA

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215--, 217--

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# Appendix F

## Graduate Education Program

### Naval and Marine Corps Officers' Graduate Education Programs

The vast majority of Annapolis graduates go directly to sea or to the Fleet Marine Force, thus beginning their professional careers in an operational environment. A few, those with outstanding records as midshipmen, may compete for a limited number of graduate scholarships. Several of these scholarships require enrollment immediately upon graduation from the Academy. Most graduates, however, will first complete their initial operational tour of duty with the Fleet before they may expect the opportunity to be enrolled in a masters program, either at the Naval Post-graduate School in Monterey, California, or in programs offered at a number of participating civilian universities. Still others will have the opportunity to undertake graduate studies at a later time in their careers.

#### JUNIOR LINE OFFICER ADVANCED SCIENTIFIC EDUCATIONAL (BURKE) PROGRAM

The Burke Program is open to five qualified midshipmen each year in the fields of science or engineering. Officers who demonstrate superior academic ability and potential may be authorized to continue their education beyond the master's to the attainment of a Ph.D. degree.

Although selected as midshipmen, graduates complete an initial operational tour of two to four years as officers prior to reporting to the civilian educational institution of their choice.

#### U. S. MARINE CORPS BURKE EQUIVALENT PROGRAM

Open to five qualified (Marine option) midshipmen each year, participation in the Burke Equivalent Program allows those selected to be guaranteed being sent to graduate school approximately two years after commissioning. The field of study for each Burke Equivalent Program selectee is chosen by him from an extensive list of approved disciplines.

#### SCHOLARSHIP PROGRAM

Nationally known scholarships or fellowships are available to qualified graduates of the Naval Academy. Graduate studies may be pursued in various fields and in several countries while receiving pay as a commissioned officer in the Navy or Marine Corps. Among programs for which midshipmen have been selected in recent years are the following:

| Scholarship                 | Degree Attainable |
|-----------------------------|-------------------|
| Guggenheim                  | M.S./Ph.D.        |
| National Science Foundation | M.S./M.A./Ph.D.   |
| Rhodes                      | various           |
| Olmsted                     | various           |
| Fannie & John Hertz         | various           |

In addition, each year, a few highly qualified graduates apply directly to various graduate schools and are awarded scholarships.

*Self-discipline is that which, next to virtue, truly and essentially raises one man above another.*

JOSEPH ADDISON

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*"Sailing saves me some days when there's a lot of pressure in classes and in the Hall . . . means a lot to me, and I'm close to the other people on the team."*



*Forecasting is very difficult—especially if it's about the future."*

THE FIRST LAW OF  
FORECASTING/EDGAR  
IEDLER

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**Photography:** Cover by Robert de Gast. Historical photographs from Naval Academy Library. Sailing photographs include photographs by Cindy Bell. Other photographs in this catalog were taken by freelance photographers Robert de Gast, Norman Goldberg, Dermott Hickey, Robert Klohr, Jerry Luchansky (aerial), Joseph Martin, Ernest Meyette, and Susan Thompson, and (all official U.S. Navy) by PH3 David Longstreath of the Atlantic Fleet Audio Visual Command, by PH1 Jay Davidson of the Naval Academy Public Affairs Office, and by the following civilian photographers of the U.S. Naval Academy photographic laboratory: David Eckard, Don Mathis, Jack Moore, and Ken Mierzejewski.

# Calendar

## 1978-1979

|                  |           |                                                                                            |
|------------------|-----------|--------------------------------------------------------------------------------------------|
| May 26           | Friday    | Orientation Day, Class of 1982.                                                            |
| July 6           | Thursday  | Class of 1982 enters.                                                                      |
| August 18-20     |           | Parents' Open House, Class of 1982                                                         |
| August 23        | Wednesday | Leave and summer training expire for three upper classes.                                  |
| August 28        | Monday    | First semester begins.                                                                     |
| September 4      | Monday    | Labor Day, holiday.                                                                        |
| October 9        | Monday    | Columbus Day, holiday.                                                                     |
| October 15-19    |           | Mid-term exams.                                                                            |
| October 28       | Saturday  | Homecoming.                                                                                |
| November 11      | Saturday  | Veterans' Day, holiday.*                                                                   |
| November 23      | Thursday  | Thanksgiving Day, holiday.                                                                 |
| December 2       | Saturday  | Brigade at Army-Navy game, Philadelphia.                                                   |
| December 14-22   |           | Examinations.<br>Christmas leave begins after last scheduled examination or military duty. |
| January 14       | Sunday    | Leave ends.                                                                                |
| January 15       | Monday    | Second semester begins.                                                                    |
| February 19      | Monday    | Washington's Birthday, holiday.                                                            |
| March 1, 2, 5, 6 |           | Mid-term exams.                                                                            |
| March 6          | Tuesday   | Mid-term leave begins after last scheduled class or military duty.                         |
| March 13         | Tuesday   | Mid-term leave ends.                                                                       |
| April 15         |           | Easter.                                                                                    |
| May 10-18        |           | Examinations.<br>Leave begins after last scheduled examination or military duty.           |
| May 21           | Tuesday   | Leave ends.                                                                                |
| May 24           | Thursday  | Graduation Week begins.                                                                    |
| May 28           | Monday    | Memorial Day, holiday.                                                                     |
| May 30           | Wednesday | Graduation.                                                                                |



*"You really come out  
of this place feeling  
good about yourself."*

\* Saturday holiday observed on Friday.

# Check-Off Calendar for Candidates

## 1978

**Spring.** Of *junior* year. Write your U. S. representative and your two U. S. senators requesting a nomination. Although many congressmen will accept later requests, some into the early months of your senior year, others select their nominees much earlier. Write early to ensure consideration. Request Precandidate Questionnaire from and submit to the Naval Academy.

**11 March.** CEEB tests. SAT and Achievement tests.\* Register by 3 February.

**1 April.** ACT test.\* Register by 3 March.

**6 May.** CEEB tests. SAT and Achievements tests.\* Register by 31 March.

**1 June.** Prospective candidates commence taking scheduled medical examinations at designated military medical examining centers. Each is individually notified of the time, date and place to report for this examination by the Department of Defense Medical Examination Review Board (Colorado).

**1 June-15 December.** If eligible (as explained in chapter 5), write the Superintendent, U. S. Naval Academy (Attn: Candidate Guidance Office) requesting presidential and/or other service-connected nominations. Early requests are encouraged. Requests received after the administrative deadline of 15 December are considered.

**3 June.** CEEB tests. SAT and Achievement tests.\* Register by 28 April.

**17 June.** ACT test.\* Register by 19 May.

**Beginning in July.** At the request of their congressman, certain prospective candidates may be required to take a special screening examination provided by the U. S. Civil Service Commission. Many congressmen use this means to help them select their nominees.

**1 September.** Beginning on this date, nominees and *selected* prospective nominees may expect to be contacted by a local representative of the Naval Academy's Information Program.\*\*

**14 October.** CEEB tests. SAT in California, Florida, New York, and Texas, only. Register by 22 Sept.

**15 October.** Beginning on this date, early offers of appointment are made by the Naval Academy to outstanding candidates. Offers continue into the following spring as admissions files of candidates are completed and additional well qualified candidates are identified.

**21 October.** ACT test.\* Register by 22 September.

**4 November.** Deadline for receipt by the Vice President of requests for vice presidential nominations. Apply only if you believe you have an outstanding record, since the competition is nationwide. Use congressional letter format, appendix A, as guide.

**4 November.** CEEB tests. SAT and Achievement tests.\* Register by 29 September.

**2 December.** CEEB tests. SAT and Achievement tests.\* Register by 27 October.

**9 December.** ACT test. Register by 10 November.

## 1979

**27 January.** CEEB tests. SAT and Achievement tests.\* Register by 22 December.

**10 February.** ACT test.\* Register by 12 January.

**1 May.** With but *very* few exceptions, all candidates will have been notified on or before this date whether or not they have been accepted for entry.

**15 May.** Naval Academy Preparatory School class selected.

**25 May.** Orientation Day at Naval Academy for candidates who have been offered appointments as midshipmen with the Class of 1983.

**9 July.** Class of 1983 reports to Naval Academy and takes the oath of office as midshipmen.

\* Insure that you request the applicable testing service(s) to forward the results of your tests to the Naval Academy.

\*\* Naval Academy Information (Blue and Gold) organization: Some 1,700 counselors exist throughout the United States to assist young men and women interested in Annapolis. Volunteer Naval Reserve officers, alumni, and friends of the Naval Academy residing in every state of the union are designated USNA Information Officers. They stand ready to discuss questions concerning admissions procedures, academic routine, majors programs, physical training, life as a midshipman, and career opportunities in the Navy.

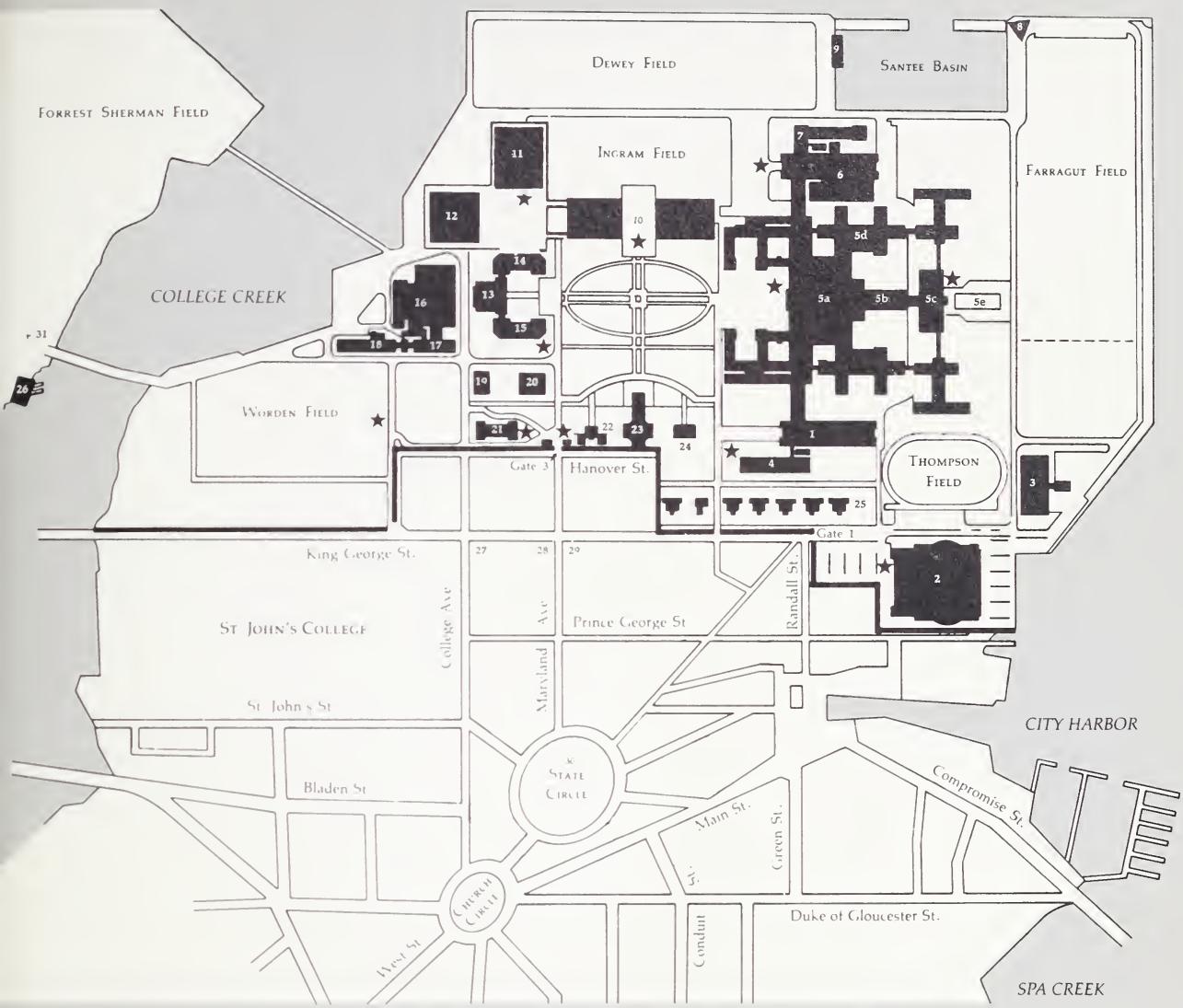
If you have questions, or if you need assistance in completing your application and do not know the name and address of your nearest Information Officer, you may find out who he is by writing or calling the nearest Naval Academy Information Officer Coordinator listed in Appendix E. If you are unable to get the answers you need within your community, write to the Director of Candidate Guidance at the Naval Academy (Annapolis, Maryland 21402), or call 301-267-2166.

One today is worth  
two tomorrow's."

BENJAMIN FRANKLIN

All prospective candidates should carefully read chapter 5 (Admissions) and the related appendices of this catalog to ensure that they fully understand the Naval Academy's admission procedures. The accompanying check list calls attention to certain key facts and dates. It is not intended as a substitute for the more detailed information in chapter 5.

SEVERN RIVER



1. Dahlgren Hall  
(Midshipmen Activity Center)  
(Registration, Parents Open House)
2. Halsey Field House
3. Ricketts Hall  
(Visitors Center)  
(Senior Enlisted Barracks)
4. Ward Hall
5. Bancroft Hall  
5a. Rotunda and Memorial Hall  
5b. Midshipmen Wardroom  
5c. Mitscher Hall  
(Chaplains Center and  
Auditorium)
- 5d. Eight Dormitory Wings  
5e. Reflection Pool
6. Macdonough Hall

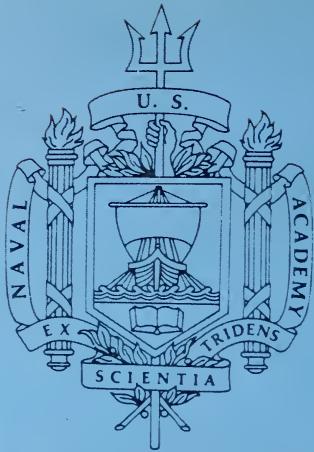
7. Luce Hall
8. Robert Crown Sailing Center
9. Vandegrift Cutter Shed
10. Michelson and Chauvenet Halls
11. Rickover Hall
12. Nimitz Library
13. Mahan Hall
14. Maury Hall
15. Sampson Hall
16. Isherwood Hall
17. Griffin Hall
18. Melville Hall
19. Leahy Hall  
(Candidate Guidance Center)
20. Preble Hall  
(Museum)

21. Officers/Faculty Club
22. Administration Building
23. Chapel
24. Buchanan House  
(Superintendent's House)
25. Officers Housing
26. Hubbard Hall
27. Alumni House
28. Chase-Lloyd House
29. Hammond-Harwood House
30. State House
31. To Picnic Area, Lawrence Field,  
Gate 8

★ Rest Rooms  
Lost and Found, Main Gate (Gate 3)



3 1262 09684 9178



*Sign on, Young Man, and Sail with me. The stature  
of our homeland is no more than the measure of  
ourselves. Our job is to keep her free. Our will is to  
keep the torch of freedom burning for all. To this  
solemn purpose we call on the young, the brave and  
the strong, and the free. Heed my call. Come to the sea.  
Come sail with me.*

JOHN PAUL JONES